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IT

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ERRATA.

In addition to those given in lists on pages 21, 36 and 100, the following errors should be corrected:

On p. 11, for "*Sisymbrium Thalianum*" read "*S. Thaliana*"; on p 15, 4th line from bottom, for "*Donnellii*" read "*Donnellia*"; on p. 34, for "*Silene Pennsylvanicum*" read "*S. Pennsylvanica*"; on p. 51, last line, for "*Hesperus*" read "*Hesperis*"; on p. 61, for "*Wollfiella*" read "*Wolffiella*"; on p. 74, 6th line from top, erase comma after "*Arisaema.*" The title of Mr. Bailey's article on p. 116 should also be corrected to read "Herbarium Olneyanum," the types having been transposed after the last proof was read.

IN BINDING.

Plate I should face page 8.
“ II “ “ “ 10.
“ III “ “ “ 48.
“ IV “ “ “ 50.
“ V “ “ “ 91.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VII.] New York, January, 1880. **[No. I.**

§ 1. **Proceedings of the Torrey Club.**—At a regular meeting of the Club held at the "Herbarium," Columbia College, Dec. 9th, the Vice-President, Mr. A. Brown, in the absence of the President, occupied the Chair. Eighteen members were present.

Mr. G. M. Wilber reported having found *Viola cucullata* in flower in the middle of November, at Flushing, L. I. Mr. N. L. Britton, exhibited a number of grasses and sedges. Among these were *Scirpus sylvaticus* L., found on Staten Island, and new to Southern New York; *Eragrostis Purshii*, Schrad., now growing plentifully in the streets in the upper part of New York city; and *Eatonia obtusata*, Gray, which Mr. Britton stated is quite common on Staten Island. Miss Elizabeth G. Knight reported the discovery by her, last August of the rare fern *Schizaea pusilla*, and of *Littorella lacustris*, both of which she found growing near the shores of Grand Lake, Nova Scotia. Miss Knight distributed specimens of these plants, and also of the fruit of *Salisburia adiantifolia* from Central Park.

Dr. Jarvis spoke briefly on the subject of galls, and gave an outline of a theory which he had formed in regard to their origin. On an invitation from the Club he signified his willingness to read a paper on the subject at the next meeting.

At a meeting of the Club, on Jan. 13, 1880, there were 29 members present. In the absence of the President and Vice-President, the Chair was occupied by Mr. O. R. Willis.

The Treasurer's report for the past year was read, and referred to the Finance Committee. Six new members were elected, and two additional names proposed for membership.

Mr. Henshaw exhibited a number of beautiful tropical orchids and euphorbias. Mr. Jos. Schrenk called attention to the presence of small tubercles on the roots of *Trifolium repens*, and briefly discussed their nature and functions.

Mr. N. L. Britton exhibited specimens from Staten Island of *Cornus florida* with double bracts.

Mr. Bicknell reported the discovery by him of *Hepatica triloba* and *Cerastium arvense* in flower on the 11th of January of the present year, at Riverdale on the Hudson.

The present being the Annual Meeting, the Club proceeded to ballot for officers for the current year, with the following result:

President, Dr. J. S. NEWBERRY; *Vice-President*, A. BROWN; *Treasurer*, JNO. J. CROOKE; *Corresponding Secretary*, W. H. LEGGETT; *Recording Secretary*, G. M. WILBER; *Editor*, W. H. LEGGETT; *Curator*, P. V. LEROY.

Owing to the lateness of the hour Dr. Jarvis signified his desire to postpone the reading of his paper on "Galls" till the next meeting.

mosses

§ 2. **Bryological Notes and Criticisms** by C. F. AUSTIN, *suggested by the careful study of a paper entitled " Descriptions of some New Species of North American Mosses ; by Leo Lesquereux and Thomas P. James. (With a Supplement by W. P. Schimper.)" Proc. of the Amer. Acad. of Arts and Sciences, Boston,* 1879, *pp.* 133-141.

First there is an introduction, from which we quote :—" On a recent visit by Mr. James to Europe, he took with him not only specimens of the species here described, but also of many of those recently described in the Scientific Journals of this country, for the purpose of critically examining the whole in co-operation with Prof. W. P. Schimper, of Strasburg. This justly celebrated bryologist has cordially given his assistance in this review, and therefore secured to the descriptions of our species a higher degree of authority." Then follows the description of 17 species, 14 of which are claimed to be new. Upon reading the introduction, our expectations were raised to a high pitch, and we were prepared for a rich feast of bryological novelties. How we fared the sequel will show.

(1.) *Sphagnum Garberi*, L. & J. Hab. Florida, *Garber.*—The diagnosis of this " new " Sphagnum, except where it is manifestly wrong, is so very like Sullivant's description (Icones p. 5), of *Sph. humile*, SCHIMP., that there cannot be the slightest doubt of their identity. This view is fully confirmed by the examination of an authentic specimen kindly sent me by Mr. James, as well as of specimens collected in Florida by Capt. Donnell Smith and myself. Furthermore : Having seen many large beds of *Sphagnum rigidum*, SCHIMP., and examined scores of specimens, including numerous forms, all the way from British America in the North, to the Everglades of Florida in the South, it is equally plain to me that *S. humile* is only a local form of *S. rigidum.* The small form (*S. humile*, S. & L. Exsic. ed. 2 n. 18, and AUST. Musc. Appalach. n. 8), which abounds from New Jersey to Georgia, is characterized by nothing worthy of note except its smaller size. In Florida it runs into the *var. humile.* Any one who has watched the growth of Sphagna in their native beds for a succession of years, must know that some of the characters emphasized by authors are of the least possible account in separating them into species ; e. g., the same bed may be all the true *Sph. cuspidatum* one year and all the true *Sph. recurvum* the next ! clearly proving the latter to be a mere state of the former. This year a bed may be all the true *Sph. cymbifolium*, and next year all the *var. squarrosulum*, &c. The most opposite extremes of those characters which are plainly visible to the naked eye are apt to occur in the same species. An abundance of heat, light and moisture producing results very different from those produced by a deficiency of the same. *Sphagnum rigidum* varies considerably, yet I have always found it one of the easiest of species to determine. Probably the *var. humile* differs more from the type than any other of its forms. Yet its differences are plainly caused by the remarkably warm and moist climate in which it grows. In all the forms the margins of the branch-leaves are usually beset with minute blackish bristle-like teeth, as in *Sph. cymbifolium* and its allies. They are also very narrowly margined, and their areolæ are furnished with largish more or less unequal indistinct pores. However, in the description of *Sph. Garberi*, both these last characters are erroneously said to be wanting. Furthermore, the chlorophyllose cells are said to be furnished with "numerous pores." Of course, this is an optical illusion; for pores belong only to *areolae* or air-cells. "The inflorescence," it is said, "is dioecious." This needs confirmation, for four reasons: 1. No part of the male plant is described. 2. All of the numerous specimens I have seen, if mature, are fertile,—this could hardly happen were the plant diœcious. 3. All the other forms of *Sph. rigidum* are monoecious. The 4th reason will become apparent to the reader further on in this review. [I have not searched for the male inflorescence because my specimens were all collected when the fruit was mature, by which time the antheridia in all Sphagna, (grown in warm climates at least) have totally disappeared.]

(2.) *Archidium longifolum*, L. & J. Hab. Florida. *Garber.*—I have seen no authentic specimens, the one sent me by Mr. James under this name being *A. Ohioense*, SCHIMP. But the perusal of the diagnosis and the habitat given, leaves no doubt of its being identical with *A. Lescurii*, AUST., first described in this Journal for Mar., 1877, (Vol. VI., p. 144). The authors affirm that the capsule and spores are as in *A. alternifolium*, BRID. Qualifying this remark slightly, they should have so extended it as to include all the other species of of the genus; and they might very properly have included the calyptra in the same category with the capsule and spores. (In 1868 I described and sketched this organ in a letter to Mr. Sullivant. I also described it in this Journal Vol. V., n. 7, p. 30, but to this day I am not aware that any one except myself and Mr. Rau ever saw it!) They also say "Antheridia 2." I have found as many as eight in one cluster.

(3.) *Bruchia flexuosa*, SCHWAEGR.—"Stems a half-inch or more in length. Inflorescence synoecious (*flos* bisexualis)." I have a large quantity of specimens of all the species of Bruchia which are common from New Jersey to Florida, all of which I have examined very carefully; but I never saw one with such long stems (exclusive of the leaves), nor did I ever see a bisexual flower except upon the minute *B. Carolinianae*, AUST., and even here the inflorescence is often autoicous.

(4.) *Bruchia Sullivanti*, AUST.—This is said to be autoicous. "Inflorescence monoecious, male flower gemmaeform," and in the very next line the authors quote Sullivant's Incones, T. 13, to substantiate the statement; yet it is both correctly figured in the Icones and described by me in this Journal, Vol. VI., n. 27, p. 143, as paroecious! (antheridia naked in the axil of a single comal leaf.) I have never seen autoicous inflorescence in any species that could be taken for either *B. flexuosa* or *B. Sullivanti*, except in extremely rare instances, all of which will be mentioned further on.

(4 *b.*) *Bruchia nigricans*, AUST. (It should read *B. nigrescens* (S. & L. AUST.; *B. flexuosa*, var. *nigrescens*, S. & L., an error of mine.) —Our authors consider this a "mere casual var. of *B. Sullivanti*,"

which may be true, but I never saw that species with such large spores. The dark color of the capsule is no doubt properly attributed by them to the plants having grown in a moist depression on the top of a mountain. The inflorescence is paroecious, and not autoicous as we are led to infer. My specimen (S. & L. Exsic, Ed. 2, n. 42) comprised only a few plants, but these were all very perfect!

No. 41 of the work just referred to, comprises three distinct forms, apparently collected in as many different places, and represents two if not three distinct species; as follows:—*B. Sullivanti* with paroecious inflorscence, medium-sized spores and smooth leaves; *B. Donnellii*, AUST. with similar inflorescence, large spores and papillose leaves; and *B. flexuosa*, SULLIV., Mosses of the U. S., with autoicous inflorescence, minute spores and smooth leaves. It is probable the last mentioned is only a form of the first. I have never seen it from any other source. Its exact habitat is unknown.

(5.) *Bruchia brevicollis*, L. & J. Hab. S. Car. *Ravenel.*—The specimens sent to me by Mr. James under this name I had before from Prof. Ravenel, who informed me that he had never collected it but once. Sullivant also had it from Ravenel, and the figures in his Icones Suppl. t. 15, *Bruchia Beyrichiana*, HAMPE., were undoubtedly drawn from it. The inflorescence of *B. brevicollis* is not given, but we are erroneously led to infer that it is autoicous.

Having seen the specimens of Ravenel and Vasey, from which the description and figures in the Icones Suppl. were drawn, I have no hesitation in saying that they all belong to *B. Sullivanti.* Ravenel's represent imperfectly developed single plants, which one may find occasionally in colonies of *B. Sullivanti;* or sometimes (rarely) growing separately. The calyptra is not longer than in the usual forms, but the capsule being shorter makes it appear so. Inflorescence, form and texture of the leaves, spores, &c., precisely as in the fully developed plants with which they grow. Vasey's Illinois specimens belong to very immature typical *B. Sullivanti!* All have paroecious inflorescence. Occasionally a plant may be found with a stunted appearance, a small short columned capsule and a large gemmaeform male flower, all of which are abnormal conditions; while in all other respects the same plant will be normal.

(6.) *Weisia longiseta*, L. & J. Hab. Florida, *W. L. Foster.*—This is included in *W. viridula*, var. *australis*, AUST. Exsic. Suppl. No. 466, and appears to be a common form of this cosmopolitan and variable species in the extreme South. It is said to be dioecious. The remark, "It cannot be taken for a form of *W. viridula*, BRID.," I am obliged to dissent from; for Donnell Smith and myself not only collected it plentifully in Florida, but also forms connecting it with the shorter pedicelled form with somewhat shorter less fissured peristomal teeth, which appears to be the common southern form of the species, occuring as far north at least as New Jersey.

(7.) *Weisia Wolfii*, L. & J. Hab. Canton, Ill. J. WOLF.—This is also said to be dioecious. It is another form of *W. viridula*, larger and a little more fully developed than the form given in Musc. Appalach. Suppl. n. 465, under *Weisia Rauei*, (vide this Jour., Vol. V., p. 20, for description). In fact Mr. Rau never sent me the delicate gymnostomous form which bears his name but once; but has frequently sent specimens from the same spot collected since, which are almost identical with Mr. James' specimens—*monoecious* inflorescence and all. But I find no male plants in specimens sent by Mr. Wolf, which are nearly identical with No. 68 of Musc. Appalach. The forms of this species are all transient, as any one must know who has watched it grow. I have found its widest possible extremes growing from the same patch during but two successive years.

The infloresense in this species, usually autoicous, is often obscure. I have often examined specimens in which I could find no male flowers, but have no recollection of ever seeing a specimen that contained no female flowers. (No. 69 of Musc. Appalach, forms no exception to this rule, for it plainly belongs to some other species. It appears to be a *Gymnostomum.*)

Weisia viridula, BRID., not only includes both the foregoing "new species," and both *W.* (*Gymnostomum*) *Rauei* and *Brandegei*, AUST., but several other about equally well characterized forms, which I am not aware have yet been described as new; and the characters in which *W. mucronata*, BRUCH, coincides with one or another of the forms of *W. viridula*, are too striking for me to accept it as a distinct species; although it is so regarded, I believe, by all the eminent authorities of Europe. In matters of this kind I have invariably found Nature to be the best authority.

(8.) *Ptychomitrium* (*Notarisia*) *pygmaeum*, L. & J. Hab. Near the Neosho River, Kansas, and at Bolivar, Missouri, *E. Hall.*—Not being able to get an authentic specimen from Mr. James, I proceeded to study carefully the description; and soon became so strongly impressed with the idea that it was at most only a form of *Pt. incurvum*, SCHWGR., that I wrote to Mr. Hall for samples of the original specimens. He generously responded with two specimens from West Mo. One from Vernon Co., which proved to be true *Pt. incurvum*, and the other from Bolivar, one of the localities given for the new moss. This is not smaller than the true *Pt. incurvum*, as it occurs in this region (Closter, N. J.), *nor are the leaves different in a single, most minute particular;* but the pedicels are a little shorter and the capsules darker and more solid, narrower, and usually more acute at the base. All the capsules are immature and shrivelled, and have a more or less diseased appearance. Even after long soaking I found it impossible to swell them out; or to remove an operculum without injuring the peristome, which, so far as I could see, is not different from the imperfectly developed peristome of the typical plant. The same is true of the annulus. As for the "marked neck of the capsule extending one-third its length;" I find it to be but a trifle more marked than I have usually seen it in immature capsules of typical *Pt incurvum;* in fact, upon long soaking and under slight pressure, it is, in the best developed capsules, not more marked than it is shown to be in Fig. 2 of Sullivant's Icones, T. 39. The Neosho River specimens, received since the above was written, differ from the last only in having all the capsules very old, and the calyptras all very young,

(9.) *Fissidens Garberi*, L. & J. Hab. on the bark of trees, Florida. *Garber.*—I have not been able to secure a specimen from

Mr. James; but in Mar. 1877, Capt. Donnell Smith sent me from the Indian River, Florida, a little Fissidens which I described at the time as new, and sent a specimen to Mr. James. He replied that he already had it diagnosed and ready for publication, under the name of *Fissidens Garberi*; so there can be no doubt of the authenticity of my specimens. I have since found it myself in southwest Florida, on shells, rotten wood and roots of trees. It also occurs on coquina rocks. Here again the authors are at fault with their inflorescence. They say "flos bisexualis." I have invariably found the species pseudo-dioecious, e. g., as in *F. obtusifolius*, WILS.

(10.) *Fissidens Floridanus*, L. & J. Hab. Florida, *Garber.*—I have not been able to get any clue to this moss. Mr. James informs me that he has none of it; having left his only specimen with Prof. Schimper. We are not told whether it grows on the ground or elsewhere. The leaf is said to have a "large pellucid border." This character belongs to but two species in this country, known to me, and both of them are common in Florida. They are *F. decipiens* and *F. adiantoides*,—the former dioecious, the latter monoecious:—(both have lateral inflorescence.) In one place the inflorescence is said to be "monoecious, with the male fls. terminal on longish lateral branches, and the female fls. axillary on the middle of the stem." In another place, "the species," it is said, "is related to *F. osmundioides* HEDW. [which is diœcious!] by its monoecious, terminal inflorescence." In one place the capsule is said to be oval-oblong and cernuous;" in another "oblong-cylindrical and curved." Upon the whole, the ambiguity of the description, together with the paucity of the specimens, would seem to exclude this "new moss" from the category of things having an actual existence.

(11.) *Cryphaea pendula*, L. & J. Hab. Florida, *J. D. Smith.* (*C. glomerata*, var., AUST., Musc. Appalach. Suppl. n. 526.)—In the first place I believe the specific name is not well chosen; for, if I am not greatly mistaken, the plant is the reverse of pendulous. In the second place, excepting that the leaves towards the ends of the usually longer stems are longer acuminate, I am unable to find any difference between this and the common plant which is sometimes found as far north as New Jersey, and which is known as *Cryphaea glomerata*, SCHIMP. In the form of the ordinary stem-leaves, areolation of the same, perichaetial leaves, capsule, calyptra, operculum, annulus, peristome, spores, and in the ramification, I am unable to find a shadow of difference between them. In this case the authorities upon *Cryphaea glomerata* appear to have been sufficiently consulted; not so the typical plant itself!

(12.) *Hypnum Watsoni*, L. & J. Hab. Colorado, *Watson.*—There is a more accurate description of this species in the Bryology of the 49th, paralell, by Mitten, under the name of *Hyp. plicatile.* (1864.) It is undoubtedly *Hyp. Heufleuri*, JURATZKA. (1861.) (compared with a specimen from Schimper kindly furnished by Mr. James.) It is also *H. revolutum*, LINDB., Ms. & *H. recurvo-marginatum*, n. sp? AUST. Ms. I have many specimens of it from Colorado, Oregon and Brit. Columbia. It also occurs in the high latitudes and alpine regions of Europe. The most striking feature of the species is the (usually) broadly revolute margin of the leaf, from base to point. The capsule is curved in the middle from an erect base, the operculum is shortly conic and very obtuse. The leaves are often serrulate at the apex, shortly bicostate, and furnished with a larger or smaller, usually not well defined patch of very short and minute, more or less obscure cells at the basal angles. In mode of growth, ramification, and in the reticulation of the leaves it is variable. I have what appears to be a form of this species also from Monterey, Mexico.

(13.) *Hypnum Alaskanum*, L. & J. Hab. Alaska, *W. H. Dall.*—A fine species and deserving a more complete description than our authors have given it. They describe it by now comparing and now contrasting it with *Hypnum Schreberi*, WILLD, to which they in the main liken it. The form of the leaf, excepting that it is not involute-acuminulate at the apex, is much as in that species; but in size, facies, closely pinnate ramification, texture of the leaves, presence of paraphyllia on the stem, &c., it is totally distinct, being a true *Pleurozium*, as the following description from specimens communicated by Mr. James will show:

[**Hylocomnium (Pleurozium) Alaskanum.**—*Hypnum Alaskanum*, *L. & J.* in Proc. Amer. Acad., Boston, for 1879, p. 139.—Stems closely pinnately and bipinnately branched, and, as well as the branches, densely paraphyllate, about ½'—¾' wide; branches widely spreading, (the ramuli very short and mostly divaricate), subdepressed, obtusish or acutish. Paraphyllia much divided, the divisions capillary. Stem-leaves large, broadly ovate, rotundate-obtuse, concave, smooth, of a firm texture, even, or here and there sulcate-striate, particularly near the lower margins, which are usually (either broadly or narrowly) revolute and often apparently solid, shortly and obscurely somewhat bi-pluricostate; the margins remotely serrate-denticulate; ordinary cells elongated, linear, subvermicular, remarkably obtuse at both ends, more or less discrete, opakish,—the interstices more or less confluent; the basal cells somewhat widened, but scarcely shorter, solid, dark fulvous, not well defined; both in the centre and at each margin, where they are the most conspicuous, these fulvous cells extend upwards for a longer or shorter distance, often forming costæ-like striæ. Branch-leaves much smaller and less denticulate, otherwise similar. Inflorescence and fruit not seen. Nearest to depauperate forms of *H. splendens*, (HEDW.) from which, however, it is readily distinguished by its more uniform less compound ramification, obtuse smooth more shortly bicostate more opake less serrulated leaves, with more obtuse and more discrete cells, &c.]

(14.) *Ephemerum spinulosum*, SCHIMP.—The remarks here made by Schimper, as well by L. & J. upon both this species and *Ephemerum crassinervium*, SCHWGR., although true enough upon the whole, throw no new light upon these two protean mosses. I have spent hour after hour vainly trying to arrange my specimens and to separate them into intelligible forms, and should hail with delight a dissertation upon them that would point me the way out of the difficulty.

(15.) *Systegium erythrostegium*, BRUCH & SCHIMPER, *Phascum* *crispum*, var. *rostellatum*, H. & W., in Drummond's Southern Mosses No. 10. Hab. New Orleans, Drummond.—I have not been able to see Drummond's No. 10, but I have a *Systegium* from the same region, collected by Hall, Mohr and Featherman, which appears to be not rare throughout the Gulf region, and the only species yet found there; for the diagnosis of Bruch and Schimper describes it with sufficient accuracy. It is *Astomum* (*Systegium*) *Ludovicianum*, SULLIV, Icones, T. 12. The male flower is terminal, becoming lateral, as B. & S. describe it; or probably in rare instances becoming dichotomal as shown in the Icones.

(16.) *Orthotrichum brachytrichium*, SCHIMP.; *O. obtusifolium*, Drummond's Mosses of Brit. Amer., n. 157. Hab. Canada East to the Rocky Mts.—There is some mystery here which I am unable to solve. Drummond's moss is identical with the European *O. obtusifolium*, SCHRAD., which is most accurately described in Schimper's Synopsis, Ed., 1860, p. 263. It is also identical with the numerous specimens which I have from the same region, collected chiefly by Fowler and Macoun. Schimper describes it as having "apiculate acutely carinate most minutely papillose leaves, with the margins subrevolute-reflexed, inflorescence monoecious, calyptra pale straw-colored, and with a few short hairs on its apex." I find the leaves to be obtuse, not carinate, mostly clothed with large papillae, inflorescence dioecious, calyptra with a pale base, fuscous brown above, epilose, and papillose-tuberculate. I have picked from among some *Orthot. Ohioense*, collected by myself in the Jordansville Swamps, N. Y., about a half-dozen sterile stems of this species. Some of these have the leaves all obtuse, more have them nearly all acute or acutish, and one or two of the stems have the upper leaves somewhat hyaline-apiculate; otherwise they are normal. I have not seen acute leaves on any other of my specimens. There is a depauperate form of this species, always sterile, found on shade trees, old stone fences and limestone rocks, as far south as New Jersey.

(17.) *Plagiothecium pseudo-Silesiacum*, SCHIMPER, *Hypnum Silesiacum*, H. & W., in Drummond's Southern Mosses No. 111. Hab. Near St. Louis.—I have not been able to get a fragment of No. 111, from this collection. But since nothing answering to Schimper's description, except *Plagioth. striatellum* (BRID.), and *Pl. turfaceum*, LINDB., appears to have been found in North America, at least since Drummond's time; there can be little if any doubt of its being one or the other of these widely distributed species. The basal cells of the leaf not being described, leaves some doubt as to which of the two it belongs; but since the description fits the former in some respects exactly, while it fits the latter only in a general way, and since the former is the more southern specie, it becomes quite apparent that the moss above referred to is only *Pl. striatellum*. (*Pl. Muhlenbeckii*, BR. EU.)

§ 3. **A New Fungus.**—By W. R. GERARD.

Simblum rubescens, *nov. sp.*—Volva subglobose, whitish, bursting irregularly into three or four lobes, which soon become very remote from the stipe. Receptacle depresso-globose, very slightly broader than the stipe, cancellate; branches crisped, flattened, and with sinu-

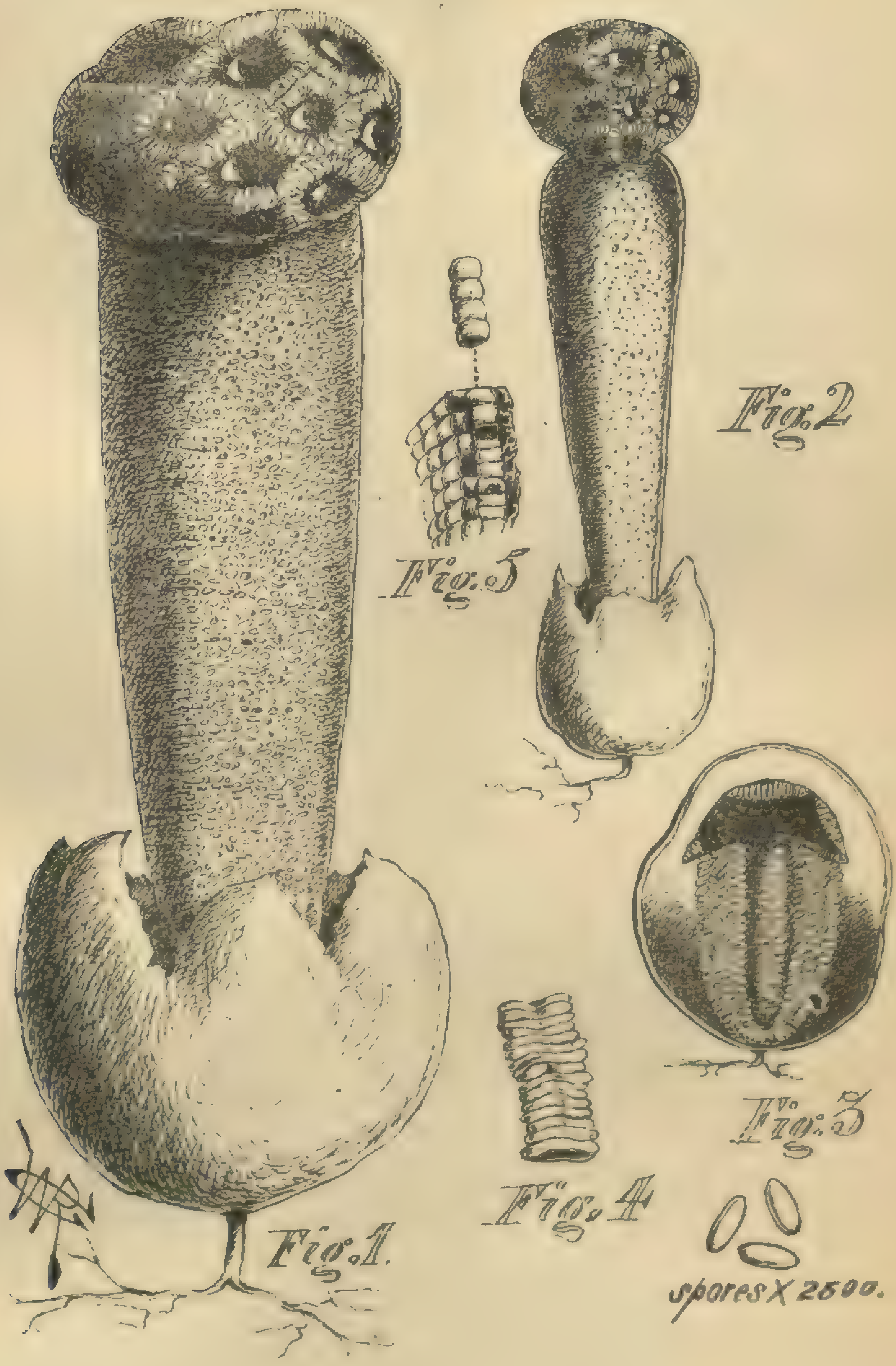


Fig. 1.
Fig. 2
Fig. 3
Fig. 4
Fig. 5
spores X 2500.

SIMBLUM RUBESCENS Gerard.

(Natural size.)

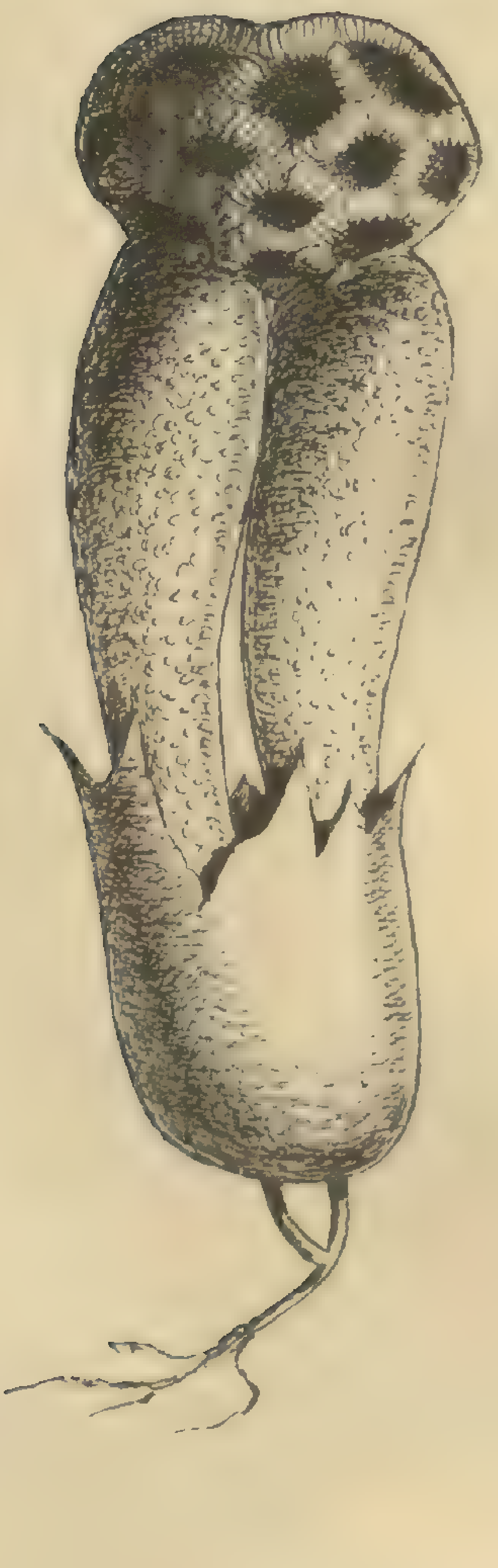
ated margins, forming, by their oblique anastomosing, areolations which are nearly always quite regularly pentagonal. Stipe hollow, elastic, cylindrical, tapering towards the base, abruptly rounded at the apex and strongly constricted at its junction with the capitulum. Hymenium olive-brown (ochreous yellow when dried in a thin stratum on paper.) Spores obtusely elliptical, .0001′ (.003 mm.) long. Plants from 3 to 5 inches high ; stipe six lines to one inch in diameter at the broadest part. Color deep fleshy red, bordering on vermilion in the capitulum, and paler towards the base of the stipe. The odor emitted by the sporiferous mass is a peculiar and indescribable one and can be best compared to that of *Corynites Ravenelii*—heavy and slightly nauseous, but not fetid. Shortly after the fungi are gathered, and especially while they are being dried, the smell, at a short distance, is not unlike that of benzoic acid.

Habitat. Among grasses in open places, in various parts of Astoria, Long Island.

My attention was called to this fungus by the Rev. Washington Rodman, who showed me last August, a colored drawing of it made by Miss Trask for her father, Dr. James B. Trask, its discoverer. Having subsequently received fresh specimens of the plant itself from both Mr. Rodman and Mr. Wm. B. Halsey, I recognized it as a species of *Simblum*—a remarkable addition to our American flora, inasmuch as the genus has hitherto been considered as exclusively a tropical one. Of the species which have been described, *Simblum periphragmoides* Klotzsch, the large, robust species, on which the genus was founded, occurs in the Mauritius Islands ; *S. gracile* Berk. (for a description of which I am indebted to Prof. W. G. Farlow) is found in Ceylon ; *S. flavescens* Kurtz, in Java ; and *S. pilidiatum* Ernst., and *S. sphaerocephalum* Schlecht., in South America. A comparison of the species under consideration with the original descriptions and figures as given by the authors of the foregoing, showed it to be quite distinct, not only as regards form but also as to color and other characteristics. Of the species just mentioned, the first and second are pale yellow ; the third sulphur yellow ; the fourth white ; and the fifth, although described by Schlechtendal as " more of a brick than of a flesh-red," is figured as a brownish yellow. Of these species, *Simblum rubescens* is most nearly related to *S. sphaerocephalum*, but differs in the form of the upper part of the stipe ; in the bright red color, which is deeper in the receptacle ; in the color of the hymenium ; in the odor emitted by the sporiferous mass, which does not, as Schlechtendal expresses it, " stink fürchterlich," but is merely slightly nauseous ; and in the shape of the volva, the lobes of which, after bursting, expand very widely and form a very shallow cup, to the centre of which is affixed the stipe by its exceedingly narrowed base. The plants are solitary and make their appearance after the rains of Summer and Autumn. The capitulum as it bursts from the volva, always carries up with it a small piece of the latter temporarily attached to its upper surface, as does *S. gracile*, according to Mr. Berkeley, in his description and figure of that species. A section of the stipe shows that it is composed of three layers of elongated chambers or cells, the thick lateral walls of which, while the plant is still enclosed in the volva, (Pl. 1, Fig. 3), are several times plicated or folded and strongly compressed. In the mature plant, the evidence of these plications is still visible, causing the expanded chambers to appear as if composed of a string of roundish cells of nearly uniform size; as seen in Fig. 5 of Plate 1, which represents an edge of the stipe in section, and shows the external aspect of the cells or cavities as seen in its interior. The external walls of this innermost layer of cells are smooth and continuous, and rarely perforated. Those of the extreme outer layer, in the very early stages of the plant, are entire and arranged horizontally like the cells in the hymenophore of *Cynophallus caninus;* but, when the fungus is fully expanded, these become minutely lacerated and perforated so as to give the external surface of the stipe. when viewed under the lens, a spongy aspect. The apex of the stipe is somewhat abruptly rounded and perforate; and from the margin of the aperture start the primary branches (6 to 8 in number) of the cancellate structure. These hollow branches or reticulations, septate at intervals, are an upward extension of the inner layer of cells; they have precisely the same structure, and only differ in being more vertically compressed and laterally flattened (Pl. 1, Fig. 4.) Occasionally two contiguous rows of cells unite to form one of the reticulations, and in this case the latter is marked throughout its whole extent by a deep central depression. In the smaller specimens of *S. rubescens* the areolations formed by the reticulations are in most cases quite uniformly and regularly pentagonal, but in the larger plants there appears to be a little less regularity in this respect.

The outlines of Fig. 1, Plate 1, (which represents the full size apparently to which the plant attains) were copied from a water-color drawing executed by Miss Trask, all of the specimens which I have seen being much smaller. Fig. 2 shows one of these small specimens with the capitulum slightly elevated in order to exhibit the rounded apex of the stipe and its mode of juncture with the receptacle. Although the latter features are always strongly marked in the dried specimens, they would scarcely be noticed on a mere cursory inspection of the living fungus owing to the depression of the capitulum around the top of the stipe, which is due to its somewhat flabby consistency. Plate 2 shows a curious departure from the normal form, in which two stipes arise from the same volva and support one capitulum in common. This figure, which has been photo-engraved from a sketch not intended for publication, is incorrect in one particular, the vertical diameter of the receptacle being represented at least a third too great. The specimen was brought to me by Mr. Halsey. In studying this plant, I have been under great obligations to Messrs. Rodman, Trask, and Halsey for specimens, fresh and preserved, and for various items of information in regard to it.

As the literature relating to the American *Phalloidei* is somewhat scattered, it may not prove uninteresting to botanists if I bring together in this place all the genera and species of the order which have been detected in the United States up to the present time.



SIMBLUM RUBESCENS GERARD.

(Abnormal growth.)

List of United States
PHALLOIDEI.

Phallus L. (A. Hymenophallus *Nees.*)

indusiatus Vent., S. Car., Pa. (Schw.), Mass. (Frost). Conn. (Eaton.)

Daemonum Rumph, Ohio. (Lea), N. Y. (Peck).

duplicatus Bosc. S Car., Pa. (Schw.), N. Y. (Ger.), Mass. (Frost: Sprague), Conn. (Wright.)

Ravenelii B. & C., S. Car., (Rav.), N. Y. (Pk.)

(B. Ithyphallus *Fr.*)

impudicus L. S. Car., (Schw.), N. Y. (Pk. Ger.) Mass. (Farlow: Frost.), Ohio (Lea),

(C. Leiophallus *Fr.*)

rubicundus Bosc. S. Car.. N.Y. (Schw.), Mass. (Frost.)

Cynophallus Fr.

caninus Schaeff. S. Car.,(Curt.) Mass.(Frost.) N.Y.(Warne.)

Corynites B. & C.

Ravenelii B. & C. S. Car., (Curt.) N. Y. (Pk.: Howe: Ger.)

Curtisii Berk. Conn. (Wright.)

brevis B. & C. (Inserted in Curtis' Catalogue but not mentioned in Berkeley's Notices of N. A. Fungi.)

Simblum Klotzsch.

rubescens Ger. N. Y. (Trask; Rodman; Halsey.)

Clathrus Mich.

cancellatus L. Ga. (Leconte, *fide* Schw.)

Laternea, Turp.

columnata Bosc. S. Car. (Bosc.), Ga. (Leconte.)

§ 4. Flora of Richmond County, N. Y.
Additions and new localities, 1879.

Podophyllum peltatum L. Sparingly near Rossville.

Nasturtium palustre DC. Near Port Richmond and Woodrow.

Draba Caroliniana Walt. Near Rossville.

Sisymbrium Thalianum Gaud. Near Woodrow.

Camelina sativa Crantz. Rossville village.

Linum usitatissimum L. Sparingly at Clove Lake.

Coronilla varia L. Roadsides near New Dorp and Giffords.

Desmodium laevigatum DC. Sparingly near Tottenville.

Trifolium incarnatum L. Sparingly in waste ground near Richmond.

Rubus strigosus Michx. Near Pleasant Plains.

Fragaria Indica L. In Richmond Village.

Ribes floridum L. Near Pleasant Plains.

Coriandrum sativum L. Sparingly along the Sea Beach, near New Dorp.

Cicuta pulpifera L. Linden Park Swamp.

Lonicera parviflora Lam. Near Prince's Bay, 1870, [W. H. Leggett.]

Sericocarpus solidagineus Nees. Tottenville.

Aster concolor L. Kreischerviile.

Solidago patula Muhl, Clove Lake Swamp.

Solidago neglecta T. & G. Clove Lake Swamp.

Vaccinium Pennsylvanicum Lam. Rather abundant about Tottenville.

Vaccinium macrocarpon Ait. Sparingly near Clove Lake. Near Richmond.

Gaylussacia frondosa T. & G. On Goat Hill, near New Dorp, and at Tottenville. Frequent.

Monarda fistulosa L. On Richmond Hill, and near Willow Brook.

Lophanthus nepetoides Benth. New Dorp.

Phlox subulata L. Near Rossville. (G. W. Wright.)

Solanum rostratum Dunal. A single plant near Four Corners, 1875. (W. H. Rudkin.)

Artemisia vulgaris L. Port Richmond.

Atriplex patula L. var. **littoralis** Gray. West New Brighton.

Quercus Phellos L. Sparingly at Tottenville.

Sparganium eurycarpum Engl. Near Garretsons.

Vallisneria spiralis L. Clove Lake Swamp.

Calopogon pulchellus R. Br. Linden Park Swamp,

Habenaria ciliaris Lindl. Tottenville.

Habenaria tridentata Hook. Tottenville.

Tradescantia Virginica L. Escaped from gardens at Tottenville.

Cyperus cylindricus N. L. Britton. Tottenville.

Eriophorum Virginicum L. Near Richmond.

Rhynchospora alba Vahl. Clove Lake Swamp.

Cladium mariscoides Torr. Linden Park Swamp.

Carex subulata Michx. Swamps near the railroad. (W. H. Leggett.)

Carex monile Tuck. Near New Dorp.

Carex lanuginosa Michx. Near New Dory.

Carex sterilis Willd. Rather common.

Agrostis alba L. Common.

Calamagrostis Canadensis Beauv. Linden Park, and Clove Lake Swamps.

Calamagrostis Nuttalliana Steud. Watchogue and Tottenville.

Eatona iobtusata Gray. Linden Park Swamp.

Glyceria obtusa Trin. Tottenville.

Glyceria acutiflora Torr. Near Bull's Head.

Eragrostis poaeoides Beauv. var. **megastachya** Gray. Port Rich-

Uniola gracilis Michx. Tottenville.

Arrhenatherum avenaceum Beauv. Clifton and Richmond Village.

Andropogon macrourus Michx. Tottenville.

CORRECTION.

Cyperus retrofractus Torr. (?) should be **C. cylindricus** N. L. Britton. Sparingly at Tottenville.

C. A. Hollick,
N. L. Britton.

Terms—*One dollar per annum, beginning with the January No. Address,* P. V. LeRoy, *Herbarium, Columbia College, 49th St. and Madison Ave., N. Y. Money orders on* Station H, *N. Y.*

Communications *for the editor should be addressed to* Wm. H. Leggett, 54, *East 81st Street, New York.*

Back Volumes *and copies of the Constitution and By-Laws of the Club may be obtained of the editor. Money orders on* Station K, *N. Y.*

The Club *meets regularly the second Tuesday of the month in the Herbarium, Columbia College, at 7:30 P. M. Botanists are invited to attend.*

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VII.] New York, February, 1880. **[No. 2.**

§ 5. **Proceedings of the Torrey Club.**—The regular monthly meeting of the Club was held at the "Herbarium," Columbia College, Tuesday evening, Feb. 10. In the absence of the President and Vice-President, Mr. J. D. Hyatt was called to the Chair. There were 24 members and 4 visitors present.

The following errors in the minutes, which also crept into our preceding report, were corrected: *Stellaria media*, not *Cerastium arvense*, was found in flower Jan. 11th; and the double-bracted *Cornus* was exhibited by Mr. Schrenk, not by Mr. Britton, as stated.

Mr. LeRoy exhibited a specimen in flower of *Sarracenia flava*, L., the roots of which had been brought from the swamps of South Carolina.

Mr. Wright of Staten Island exhibited a black-flowered Iris, raised from a bulb direct from Egypt.

Mr. J. D. Hyatt exhibited a remarkable and beautiful woody gall, the leaf-like lobes of which were curiously carved and almost seemed executed by the hand of an artist. The specimen came from Mexico.

Mr. Hollick, in behalf of the Map Committee, presented a large geological map of the district embraced within the limits of the Torrey Catalogue, the joint work of himself and Mr. Britton.

The Case Committee reported that the new case for the herbarium of the club had been purchased, and was now ready for the inspection of members.

Mr. Samuel Henshaw was elected a member; and the names of two other persons were proposed for membership.

At the suggestion of Mr. Leggett, Mr. W. R. Gerard was elected assistant editor of the BULLETIN.

Dr. Jarvis read a paper on "Galls." The author, who has made a life-long study of these organisms, briefly reviewed the opinions that have been held in regard to their formation from the earliest times up to the present, and boldly took issue with Darwin, Huxley and others in regard to the statement that these excrescences were of insect origin. He asserted that these gentlemen had merely accepted the statements of others without personal investigation of the facts. Dr. Jarvis claimed, and it was the object of his paper to prove, that all galls are normal productions of the plants on which they grow; and that these productions, by a species of evolutions of the protoplasm contained within them, eventually gave birth to animal life. The life history of these beings, from the formation of the primordial utricle up to the period when they make their egress in a perfect state from the zoocarp (as the author styles the gall), was minutely described by means of large diagrams and numerous specimens of galls derived from various plants.

Owing to the lateness of the hour, the botanical paper of the evening, by Mr. Hollick, on the "Relation between Geological Formations and the Distribution of Plants," was merely read by title and handed to the Editor for publication in the BULLETIN.

§ 6. **Relations between Geological Formations and the Distribution of Plants.**—The notes, from which this paper was compiled were taken during the past season on Staten Island and are, therefore, very restricted and local in their nature; but even within such narrow limits, the effect which the geological formation seems to have on its accompanying flora is so marked, that it seems of vast importance, alike to the practical botanist in his collecting tours, and as a field of speculation for the theorist.

We have, on Staten Island, two well marked geological features—the *Drift*, which covers about two-thirds of the entire Island, nearly all the northern part and extending as far south as Princes Bay, and the *Cretaceous*, which occupies the remaining small area in the southern and western part. This latter is a continuation of the New Jersey clay beds.

The geological line of separation between the two formations is not always very distinct, but the limits of the different species of plants mark it in unmistakeable characters. The two floras are remarkably distinct. That one belonging to the Cretaceous is well represented by *Arctostaphylos Uva-ursi*, *Aster concolor*, *Pinus inops*, *Quercus Phellos*, *Quercus nigra*, *Lycopodium inundatum*, *var. Bigelovii*, and many more of the Pine Barren plants. Thus far I have never found one of these species to have crossed the line of the Drift, but in their stead will be found *Pinus rigida*, *Quercus alba*, *Quercus rubra*, etc., and the majority of those plants which grow in the vicinity of New York Island, and up the Hudson.

Those plants which belong to the Drift seem to adapt themselves more readily to the Cretaceous than "vice versa," for while we find *Quercus alba* and *Pinus rigida* growing in Cretaceous clays and sands, the *Quercus Phellos* and *Pinus inops* have never been seen out of their natural geological location. The same may also be said of the more northern species of *Aster*, which occur quite plentifully with *Aster concolor*, but this latter will not spread beyond the Cretaceous. It would be interesting to know if these facts hold good in other localities. It almost seems as if the Drift flora were gaining on the Cretaceous and gradually crowding it off the Island.

A curious and interesting case of restricted locality, due apparently to geological causes, is seen in *Clematis ochroleuca*, which only grows on the dry hills of magnesian rocks which form the main ridge of the Island and in the vicinity of the Limonite ore deposits.—It is accompanied by *Cerastium oblongifolium*, which likewise seems equally restricted. Do these same conditions prevail in other localities where these comparatively rare plants occur?—In an isolated hammock of soapstone and iron ore, fully three-fourths of a mile away from the ridge, and having no intermediate connections, *Clematis ochroleuca* was found. Probably by others, who have had a wider area for research, many more instances of a similar nature may have been noted, as for example the well known restriction of *Camptosorus rhizophyllus* to the vicinity of limestone cliffs.

When the effects of the geological formation on the distribution of plants and the relations between them are better known, it will certainly facilitate the efforts of the collector by directing him to localities where the geological formation is similar to that of known districts, and where he may reasonably infer that the flora will be also in keeping; provided, of course, that there is not too great a diversity in climate and physiographic conditions.

Within a radius of perhaps 50 miles it would be reasonable to expect that similar geological conditions would afford similar floras.

Port Richmond, S. I. ARTHUR HOLLICK.

[As regards *Camptosorus* we may state that, according to our own observations, the plant is not exclusively calcicolous; it is not rare in the Hudson River Valley on the slates and shales of the Hudson River Group. And we may say the same of *Asplenium Ruta-muraria ;* which also is usually described as one of the lime-rock ferns.—EDS.]

Setaria glauca, Beauv. and **S. viridis,** Beauv.—Last Summer I collected indiscriminately, and from many localities, specimens of *Setaria.* During this Winter I analyzed about 15 of them under the microscope and found only *one* specimen of the *S. viridis !*—Is the *S. glauca* so much the commoner of the two, or was this only accidental?

A. H.

§ 7. **Bryological Notes,** by C. F. AUSTIN.

Sphagnum macrophylum, BERNHARDI *Var.* **Floridanum,** AUST. —Differs from the typical form, as described and figured in Sulliv. Icon. p. 1. t. I., and as represented in various exsiccati, in its lurid green, or often albescent color ; but chiefly in the areolae of the leaves being about twice as long and furnished with 40–70 *extremely minute pores, in two rows.*—A remarkable var. Hab. Florida.

Sphagnum cuspidatum, EHRT., *Var.* **serratum,** AUST.—*Sphagnum serratum,* AUST., this Journal, vol. vi., p. 245 ; also Musc. Appalach. Suppl n. 453.—Specimens collected by Capt. Smith about Lake Harris, Fla., last spring, show pretty conclusively that this is only a remarkable form of *Sph. cuspidatum ;* only the leaves on the uppermost branches being decidedly serrate.

Bruchia Sullivanti, AUST., *Var.* **microtheca.**—Form and texture of the leaves normal ; but the plants are much smaller than usual. The capsule is about half the usual size and of a fine light brown color, with a remarkably short collum usually passing insensibly into the pedicel, which is geniculate when moist and straight when dry. Sporangium round-oval, twice the length of the collum. Spores among the smallest of the genus, or about 1-1,000 of an inch in diameter, *not papillose but very minutely granulose.* Inflorescence for the most part antoicous, Hampden Co. Va. Apr., 1878. J. D. S.

DONNELLIA, nov. gen.

Donnellii Floridana, AUST., *Fabronia Donnellii,* AUST., *in Bot. Gazette,* vol. ii., p. 111.—" Folis oblongo-lanceolatis strictiusculis nonnunquam submarginatis obsolete serrulatis fere ecostatis, cellulis perangustis, basilaribus majoribus subquadratis inflatis ; capsula ovali subincurva vacua sub ore constricta, peristomii dentibus 16 majusculis siccis subhorizontaliter incurvis humidis erectis apice leniter recurvis, articulatiionibus dorso valde prominentibus; autoica; fl. masc. parvo juxta femineum posito.

Hab. On the branches of a Live Oak, Florida, Feb. 1877, *Capt. John Donnell Smith.*

Mode of growth and form of capsule much as in *Hypnum microcarpum*, C. M., but smaller in all its parts, with narrower and more narrowly reticulated leaves not recurved on the margin, the inflated cells at the basal angles more numerous, peristome single, &c.—Remarkable for the prominent articulations of the peristomal teeth.

RAUIA, nov. gen.

Rauia scita, AUST.—*Hypnum scitum*, BEAUV., Prod. p. 69; AUST. *Musc. Appalach. n.* 300; also this Journal, vol. v., p. 3.—*Thuidium Appalachiani*, AUST., Mss.

Modus vegetandi, folii formis et textura ut in *Thuidio*, sed capsula peristomiaque leskeoidea.

Thuidium Alleni, *n. sp.*—Caule erecto vel depresso fasciculatim innovando bipinnatim ramuloso dense paraphyllato; foliis siccis crispatis, humidis latissime ovatis concavis brevissime subacuminulatis obtusis vel acutis planis vel subsulcatis, margine minutissime papillato-crenulata pro more plana, costa valida fere ad apicem continua, basi auriculata subdecurrente, cellulis minutissimis plerumque distinctis rotundiusculis minute unipapillosis, basilaribus vix majoribus; ramulis inferioribus brevibus laxis flexuosis eparaphyllatis, foliis minutis valde concavis ovatis obtusis, costa tenuiore et paullo breviore; superioribus majoribus strictis paucissime brevissime paraphyllatis, foliis cum caulinis subconfoimibus; paraphylliis longis simplicibus vel parce divisis geniculatis; floribus et fructu ignotis.

Hab. In a peat swamp near New Haven, Conn., Jan. 1880, *Mr. John Allen.* Communicated by *Prof. O. F. Allen* of the Sheffield Scientific School. Resembles *Thuidium minutulum* (HEDW.), but is much larger. At a casual glance it would be apt to be mistaken for *Elodium paludosum*, SULLIV. But that is never bipinnate, has leaves acutely acuminate with longish cells, which are often not papillose, &c. It gives me great pleasure to be able to dedicate so fine a species to the Allens, father and son. They have recently sent me ample specimens of some very rare mosses, all in the finest condition. Among these is *Trichodon nodulosum*, AUST.

§ 8. **Cheilanthes vestita,** Swartz.—Mr. Chas. N. Arnold has sent us from Poughkeepsie a number of specimens of *Cheilanthes vestita*, Willd., gathered near that city by Mr. Clarence Lown. A note from Mr. Lown states that this fern was first detected by him growing on the rocks in the vicinity of the river in April, 1877. Afterwards, in September of the same year, he found it again growing luxuriantly on the rocks at New Paltz Landing, just south of the ferry dock, and opposite Poughkeepsie. The only other known station in New York for this fern is Washington Heights, where it was detected some years ago by Mr. Denslow. As Mr. C. H. Peck remarks, Poughkeepsie will doubtless prove its northern limit in this State.

§ 9. **Trichomanes radicans,** Swz.—Mrs, F. J. Harlow has sent me specimens of this fern which she collected at "Natural Bridge," four miles from Sewanee, Tenn. E. S. MILLER.

February 13th.

§ 10. **Leucanthemum vulgare,** var. **tubuliflorum.**—The variety *tubuliflorum*, Tenney, of *Leucanthemum vulgare*, which was detected at Poughkeepsie in 1867 by Miss Crockett of Vassar College, has made its appearance in great abundance every year at the same locality where it was first found, and from which it has never spread. The ray flowers in this pretty variety are tubular, unilateral in varying degrees, and 5-lobed like the disk flower. I have found in nearly every instance that they possess two (rarely four) abortive stamens, i. e., stamens destitute of pollen. Dr. Gray, in his Manual (ed. 1868, p. 686) says of this variety: "An abnormal state of the White Weed, with the rays transformed into large and palmately or bilabiately 5-lobed (rarely 3-4-lobed) tubular corollas." But have we an instance of what we may really call "transformation?" Should not the pistillate ray flowers of the ordinary form of *Leucanthemum* themselves be regarded as *transformed* marginal disk flowers, the unilateral development of which has adapted them to assist, as Mr. Darwin suggests, in the process of cross-fertilization by making the plants more conspicuous to insects. And would it not be more proper, then, to consider the tubular ray flowers of the variety not as cases of "transformation," but rather as instances of partial *reversion*, by the regaining of lost organs, to some ancient form of the plant in which all of the flowers were tubular and perfect? I have a specimen of *L. vulgare* in which all the flowers—those of the disk as well as those of the ray—are ligulate and pistillate; and also a garden specimen *Chrysanthemum carinatum* in which, through an arrest of development, a large number of the disk flowers have lost their stamens and their purple color, and have become partially ligulate. These two instances, which come under the head of what gardeners call "doubling," I should judge are examples of what might be properly styled "transformation." W. R. G.

§ 11. **Suffolk County Plants.**—I have the pleasure of adding the following plants to the flora of Suffolk Co., L. I.

Hypericum adpressum, Barton, a few plants at the "Slough" on the East Hampton and Sag Harbor turnpike. At the same station, *Habenaria ciliaris*, R., Br. I also found it at Springs. At this place I found a Habenaria of a beautiful straw color, intermediate as it were between H. ciliaris and H blephariglottis. I was unable to visit the locality last year, so I cannot tell whether it is constant or not. H. blephariglottis grew in the same locality. I found in Amigansette *Lilium Philadelphicum*, L., though only a few plants. I was told that it grew plentifully on Montauk Point, though I did not observe it that year (1878). Last year it was out of flower when I was there. Mr. C. L. Allen discovered it in the woods near Wading River (1879) while we were out riding. I think I have never reported finding *Utricularia clandestina*, Nutt., at Manorville. This makes eleven species of Utricularia found in Suffolk County. I found one plant of *Conium maculatum*, L., in the yard around Clinton Academy, East Hampton. *Urtica urens*, L., grows sparingly in East Hampton, and on Gardiner's Island. *Amarantus viridis*, L., grows quite plentifully in the door yards of East Hampton. *Tripsacum dactyloides*, L., I have found very sparingly at Wading River. On the shore of Fort Pond Bay, Dr. T. F. Allen found *Glaucium luteum*, L., very abundant in 1878. I found, the same summer, on the Point, *Polygala sanguinea*, L., and *Limosella aquatica*, L., var. *tenuifolia*, Hoffman. Last summer I found *Rumex maritimus* on the eastern shore of Great Pond, Montauk Point. *Cystopteris fragilis*, Bernh., I found in a deep ravine facing the Sound, near Wading River; also in an old well, at Rocky Point, a few miles west of here. *Spiranthes graminea*, Lindl., var *Walteri*, Gray, East Hampton to Montauk, also at Wading River. *Spiranthes simplex*, Gray, grows plentifully in and around Wading River. *Potamogeton gramineus*, L., var *graminifolius*, at River Head. *Pycnanthenum lanceolatum*, Pursh., Rocky Point. *Vaccinium Oxycoccus*, L., Wading River. *Aster nemoralis*, Ait., between River Head and Canoe Place. *Desmodium Canadense*, DC., Greenport and Gardiner's Island. *Muhlenbergia sylvatica*, T. & G., River Head. *Sonchus asper*, Vill., Montauk Point and Gardiner's Island. *Calamintha Clinopodium*, Benth., *Atriplex patula*, L., var., *littoralis*, Gray, and *Phryma leptostachya*, L., on Gardiner's Island. I found *Blitum maritimum*, Nutt., at Springs.

Gardiner's Island is a very interesting locality for botanizing. The Island contains 3,000 acres, and is composed of a fine large farm, large grazing tracts, salt marshes, streams of water, and about 150 acres of woodland. I was very happy to accept the kind invitation of Mr. J. T. Gardiner to visit the Island. My time was so short that I had but little chance to botanize thoroughly. I hope to be able to visit the Island at another season, when I think I can find more plants new to our County.

Epigaea repens, L., fruited very freely this last summer and matured seed in abundance. I also found this fall a great many very small seedlings. E. S. MILLER.

§ 12. **Juncus maritimus**, Lam., a European Rush, was found on Coney Island some years ago by Mr. C. H. Peck. At the suggestion of Dr. Engelmann, I went, Aug. 2nd, to the locality on the Island indicated by Mr. Peck, to whom I had written for information, having in view the verification of the original discovery. I found the plant still growing where it was first collected, although in limited quantity. It is apparently indigenous, as there seems no evident manner in which it could have been introduced into such a situation.

It grows, as Mr. Peck writes: "Near the western end of the Island, just over the sand ridges, on the inner shore." I found it just at the junction of the salt meadows and the sand hills, about half way between the tower at "Cables," and Coney Island Point.

Dr. Engelmann writes that the plant is certainly *J. maritimus* Lam. and not *J. Roemerianus*, as was originally reported in the BULLETIN.

Carex extensa, Good, originally found on Coney Island by Dr. T. F. Allen, still exists, growing near the *Juncus*. N. L. B.

§ 13. **Presque Isle**, Pa.—*Utricularia resupinata*, Greene. which is reported from Northern New York, was also found here on Presque Isle last summer. This Peninsula was explored several years ago by Dr. Garber and by Judge G. W. Clinton, and from these reports its peculiar and interesting flora, which represents plants from the seacoast as well as several western forms, has become known. This year the Botany Section of our young Naturalists' Society, undertook to follow up the discoveries of the two named botanists, and to add to their list new ones if possible. The above named little plant was the first new find.

To give an idea of the character of the Flora of Presque Isle, I mention the following plants that were collected by our Botany Section during last summer. Cakile Americana, Nutt.; Arenaria lateriflora, L, ; Hibiscus Moscheutos, L.; Lupinus perennis, L. ; Lathyrus maritimus, Big.; Phaseolus diversifolius, Pursh.; Potentilla paradoxa, Nutt. ; P. anserina L. ; Nesaea verticillata, H. B. K.; Xanthium strumarium, var. echinatum, Gray ; Bidens Beckii, Torr.; artemisia Canadensis, Mx. ; Lobelia Kalmii, L. ; Arctostaphylos Uva-ursi, Spreng. ; Pyrola rotundifolia, L. ; P. elliptica, Nutt. ; P. secunda, L. ; Chimaphila umbellata Nutt. ; Ch. maculata, Pursh ; Ilex verticillata, Gray ; Lysimachia thyrsiflora, L. ; Utricularia vulgaris, L. ; U. resupinata, Greene ; U. cornuta, Mx. ; Gerardia purpurea, L. ; Castilleia coccinea, Spreng. ; Physostegia Virginiana, Benth. ; Scutellaria galericulata, L. ; Lithospermum hirtum, Lehm. ; Shepherdia Canadensis, Nutt. ; Euphorbia polygonifolia, L. ; Myrica cerifera, L. ; Sparganium palustre, L. ; Habenaria Hookeri, Torr. ; Liparis Lœselii, Rich ; Juncus Balticus, Dethard ; Cyperus Schweintzii, Torr. ; Carex Pseudo-Cyperus, L. ; C. histricina, Willd. ; Eleocharis quadrangulata, R. Br. ; Scirpus Torreyi, Olney ; Zizania aquatica, L. ; Sporobolus cryptandrus, Gray ; Calamagrostis Canadensis, Beauv. ; Tricuspis purpurea, Gray ; Bromus racemosus, L. Most of these plants have been reported before by the above named gentlemen.

Of the plants found in the streets of Erie may be mentioned, Conium maculatum, L. ; Blitum Bonus-Henricus, Reich. ; Euphorbia Helioscopia, L. ; and E. platyphylla, L. Our Botany Section will continue their researches next summer, and hope to report new discoveries. J. GUTTENBERG.

§ 14. **Utricularia resupinata,** Greene.—In the BULLETIN for October, 1879, are some remarks with regard to Utricularia resupinata, Greene. I collected that plant in August, 1875, at the same locality, mentioned in the BULLETIN—namely, muddy shore of Beaver Lake, No. 4, Lewis Co., N. Y. During the past season I collected quite a number of the same plant on the shore of Big Moose Lake, Herkimer Co., N. Y., and at Twitchell Lake, in the same county. I do not think it is uncommon through Northern New York.

FRANK TWEEDY.

Plainfield, N. J.

§ 15. **Aster concolor,** L., **in Rhode Island.**—I have to record the finding of *Aster concolor*, L., in Rhode Island. It was discovered by Miss Lydia Barstow, of this city, on what is known as the Old South Road, near the village of South Kingston, and again, in larger quanties, in Tuckertown, near Worden's Pond. It adds one more to the peculiar southern forms which occur in this interesting district. The plant was given me, correctly named, for confirmation. Again, all credit to the ladies!

Pods of Crotalaria expand with a jerk, sending seeds across my table, and then coiling spirally. W. W. BAILY.

Providence, R. I.

§ 16. **Varying Behavior of Plants.**—In the BULLETIN for 1878, referring to *Linum perenne*, I remarked that the behaviour of plants varied in different parts of the world. An interesting instance of this may be noted in Eggers' "Flora of St. Croix and the Virgin Islands," just issued by the Department of the Interior. In that part of the world, the common Field-mustard, *Sinapis arvensis*, has followed the cultivator, and in February produces cleistogamous flowers only, followed by the regular flowers the rest of the year. The common Water-cress, also introduced there, has never been known to flower at all. As the Field-mustard has been extensively introduced into Western New York, it would be worth while for those who have the opportunity, to watch the behaviour of the early flowers there.

THOMAS MEEHAN.

§ 17. **Impatiens fulva, action of bees toward.**—During the summer of 1878 I frequently observed the bees at work on flowers of this species, without noticing a single instance of perforation of the corolla—described in the BULLETIN for Sept., 1877—until the latter part of August, although I carefully examined many flowers. Then, one day, as I was watching a busy swarm of humble and hive bees, my attention was attracted to one of the latter, which started to enter a flower, but stopped for some reason, and crept around on the outside of the corolla, where she hung, head down, for a second, and then went on to another flower, which she entered without any hesitation. Keeping my eye on her, I picked the first flower, and found a perforation on one side of the nectary about 8 mm. from its end. Constantly watching her, I picked several flowers which she had properly entered, and found none of them perforated, but after a time she came to another flower, at which she hesitated, and then treated it in precisely the same manner as the first. This was also found to be perforated. The question now arose whether she perforated these flowers, or whether some previous visitor had done this; so when she started to crawl back on a third flower, I frightened her away, and, picking the flower, found it already perforated. Watching other bees, I failed to see another act in this manner, and was unable to find other perforated corollas. From her actions, this bee evidently was accustomed to visiting flowers in the legitimate way, until, coming to a perforated corolla, she saw the perforation from the mouth, when she crept back on the outside and sucked the nectar from the cleft, probably being able to secure more in this way than in the other.

After this I was unable to study this species till about the middle of September, when I found every full opened flower out of 55 which were examined to be perforated, some of them in at least three places.

[illegible]

[illegible] from it, [illegible]

Not having anticipated this result, I failed to note the species sufficiently, during the season, but from this it seems that occasional observations during another season will be well rewarded.

Ithica, N. Y. WM. TRELEASE.

§ 18. **Draba verna,** L., and **Sisymbrium Thaliana,** Gaud., **biennial.**—I send you to-day rosettes of radical leaves [and flowers] of Draba verna, for a twofold purpose—to show that we too have an early season, and that, so far as my experience goes, Draba verna is certainly (always?) a biennial plant. The radical leaves are formed in the fall, and the stem and flowers are developed very early in the ensuing spring. Sisymbrium Thaliana has the same habit.

Quite an abundant locality near me has enabled me to watch both of them closely. H. C. BEARDSLEE.

Painesville, Ohio, *Feb.* 18.

§ 19. **Montrosity in Carya alba,** Nutt.—My attention was recently called to a peculiar montrosity in the nut of *Carya alba*, Nutt. Instead of the seed being divided into two main segments, as is normally the case, there were three principal divisions, separated from each other by thin partitions of the endocarp, which was itself somewhat triangular in cross section. Never having noticed such a sport before, I think the fact worth putting on record.

Errata.—In the list of Staten Island Plants in the Jan. No. please correct the following misprints: p. 11, l. 6 from bottom, read "Cicuta bulbifera;" p. 12, l. 6 from top, read "Todt Hill;" l. 28, read "New Dorp;" l. 34, read "Eatonia obtusata." N. L. B.

§ 20. **Journal of the Cincinnati Society of Natural History.**—The number of this periodical, for April of last year, begins a new volume. The article of interest to botanists in this issue is Mr. Joseph F. James' "Catalogue of the Flowering Plants, Ferns, and Fungi growing in the vicinity of Cincinnati." The list of fungi embraced herein is one that was published in Mr. Lea's Catalogue in 1849, a work long ago out of print. Taking into consideration the fact that the study of Mycology is rapidly growing in favor in various parts of the country, and that the literature of the subject is greatly scattered, and some of it scarcely obtainable, the Cincinnati Society would be doing a great favor to students of this department of botany, as well as advancing the cause of science, by supplementing the bare list of fungi just noticed, with a republication of the descriptions of new species as they were originally given by Mr. Berkeley in Lea's work. We trust the Society will some day act on this hint, since, owing to the rarity of the publication mentioned, these descriptions are entirely inaccessible to most students.

As for the other portions of the Catalogue, the author here records, from his own observations, and from the Catalogues of Lea and Clark, 869 species of flowering plants, 5 *Equiseta*, 24 *Filices*, and 1 *Chara*. The number of species of fungi embraced in Mr. Lea's list is 319.

§ 21. **Botanical News.**—In the January number of the *American Naturalist*, Dr. Fred. Brendel concludes his interesting "Historical Sketch of the Science of Botany in North America, which was begun in the December number." This part embraces the period from 1840 to

1858. The mass of information here brought together is very valuable, and is not easily obtainable by the ordinary botanist, unless he be in possession of the facilities offered by a very extensive library.

The *Botanical Gazette* for January contains the following notes: "Catalpa speciosa," by Dr. Englemann; "Tennessee Plants," by Dr. Gray; "Littorella and Schizaea pusilla," by the same, in which it noted the discovery (as already reported in the BULLETIN) of these plants in Nova Scotia by our fellow-member, Miss Knight; "Notes on Fungi," by M. E. Banning; "Introduced Plants in Dallas Co., Texas," by J. Reverchon; and, "Dimorpho-dichogamy in Juglans and Carya," by Thos. Meehan.

In *Science Gossip* for January we find a "List of the Local Flowers of the British Islands"; "A Report of the *Science Gossip* Exchange Club, for 1879"; "Notes on some of the Smaller Fungi," by G. E. Massee; and, "How to Double Stain Vegetable Tissues," an article which will prove of interest to those engaged in the microscopic study of plant-structure.

In the January number of the *American Journal of Science and Arts*, Dr. Gray sums up the "Botanical Necrology for 1879." From this we learn that the number of well-known botanists who have passed away during last year is fourteen. The additional note in the February issue, just received, raises the number to sixteen.

Last year we referred in a brief note to some investigations that had been made by Prof. Church, of England, on "Vegetable Albinism," and in which he showed that albino leaves contain less lime, but more albuminoid nitrogen than green ones, thus indicating a capability for development without actual growth. We learn from the *Chemical News* that, in a more recent paper read before the London Chemical Society, Dec. 20, 1879, Prof. Church shows that these albino leaves do not perform leaf-functions—that they do not possess the power, even in sunshine, of decomposing the carbon dioxide of the air, but that they add largely to the amount of that gas therein, thus resembling the petals of flowers, and the action of green leaves during darkness. The author also investigated the comparative loss and gain of albino and green foliage when caused to grow under the same conditions.

A recent number of the *Berliner Monatsschrift* reports some interesting experiments by Prof. Hoffmann, of Giessen, on the influence produced on the sex of dioecious plants by thickly sowing their seeds, and from which he has arrived at the conclusion that sex does not reside in the seed but in the result of the conditions of germination. In spinach, for instance, he found that one hundred seeds crowded in a pot yielded two males to every female plant, but when seeds from the same sample were planted in the open ground, they gave an equal number of each sex. Similar results are said by Prof. Prantl, of Aschaffenberg, to obtain in the prothallia of ferns when crowded, and Prof. Pfeffer, of Tübigen, has observed that the same holds good with Equisetum, more antheridia than archegonia being produced.

The subject of chlorophyll has been attracting considerable attention lately, and the *Journal of Botany* notices the recently published results of Pringsheim on the functions of this substance. The author's paper is published in the Monthly Report of the Royal Academy of Sciences of Berlin, for July, and we find it also in the *Botanische Zeitung* for December 12th, along with an article on the "Chlorophyll of Plants," by F. Hoppe-Seyler. Pringsheim considers that chlorophyll, so long as it exists in the cell, protects the protoplasm from the injurious effects of sunlight, and suggests that it may serve as a regulator of respiration, by reason of its strong absorption of light, especially of chemical rays. He has also detected in the ground substance of all chlorophyll grains, and of all amorphous chlorophyll, a new body very sensitive to light, and easily destoyed by it, and which he calls hypochlorin or hypochromyl. This substance he considers to be the true primary product of assimilation of green plants, from which are derived by oxidation, under the influence of light, the starchy and oily contents of chlorophyll grains. Accumulation and growth of the latter proceed in proportion with a decrease of the hypochlorin in it. In darkness the starch is less stable than hypochlorin, showing that the conversion of the latter into more highly organized bodies in the cell is favored by the increased respiration occuring in light. In the *Comptes Rendus* (p. 862) of the Academic des Sciences, M. Gautier describes the preparation of chlorophyll in a crystalline form. The details of the process would be out of place here, and we need only say that the chlorophyll, which is usually accompanied by a yellow crystallizable substance, is obtained in the form of flattened needles. The author remarks that he believes chlorophyll to be closely allied to bilirubine, both in its chemical composition and its reactions. Like the latter, it can pass successively from green to yellow, red, or brown, by the substraction or addition of oxygen. This relation of chlorophyll to bilirubine, and consequently to the hematine derived from the blood is of considerable interest. A continuation of these researches may possibly lead to a discovery of the means by which the change from the green coloring matter of leaves to the bright colors of petals is effected in nature, and this would prove of incalculable value to the florist.

Harpers' Magazine for February, issued as usual on the 15th of the month preceding, contains an interesting and well illustrated article on the Botanic Garden of that pioneer of American botany, Jno. Bartram, a spot, which, "Among scientific men of all countries has been the Mecca of their pilgrimage when visiting our shores."

The Essex Institute have purchased all but ten of the entire edition of Mr. Geo. E. Davenport's monograph of Botrychium simplex, to be used in their foreign exchanges. The original subscribers to this paper may congratulate themselves, as the work will never be seen now "at a reduced price," the remaining copies being held at $1.50 each.

Flora of Connecticut.—Mr. James N. Bishop, Plainville, Conn., sends us a circular, advertising that he is preparing a "Flora of the State, which will include both Phenogamia and Cryptogamia. It will be published during the winter of 1880-81." He calls for authentic information from all quarters.

The flora of Connecticut is very interesting and varied. We suspect that, unless Mr. Bishop is already well advanced with his work, he has hardly allowed time enough for its completion. Some years since we found a number of interesting plants at Canaan, Litchfield Co.: we recall *Moneses uniflora*, Gray, and *Betula pumila*, L., and there are several lime loving ferns, especially *Asplenium ebenoides*, R. R. Scott, found, we see, by Mr. J. S. Adams.

The California Horticulturist, San Francisco, generally contains some matters of interest to the technical botanist. In the February number, for example, is a charming account of a trip to Lassen's Peak, by Mrs. R. M. Austin, distinguished for her researches into the flora of that State. We quote one sentence, redolent of a botanical paradise: "There are acres of Mr. J. G. Lemmon's new *Corydalis Caseana*, Gray, growing along the streams which flow into the valley from the west, filling the air with its delicate fragrance."

The American Monthly Microscopical Journal, Romyn Hitchcock, 53, Maiden Lane, N. Y., one dollar per annum, pp. 20, is in fact, a continuation of the Quarterly, whose supposed demise was so unexpected and so much regretted, but which proves to have been but a stage of metamorphosis. Among the articles of special interest to botanists are Dr. Wolle's notes on "Fresh-Water Algae."

The Alphabetical Index of all known Ferns—a reprint of the index to the second edition of Hooker and Baker's Synopsis—is printed separately by Robert Hardwicke, 192, Picadilly, W. London, 1874, and is convenient for exchanges and other purposes.

The Academy, Feb. 7, contains what seems to us an instructive notice of Huxley's "Crayfish," by H. N. Mosely, in which, however, we find the following statement: "A most interesting fact is that the genus Astacus is represented by several species in British Columbia, Oregon, and California, while on the other side of the Rocky Mountains all the crayfish belong to a different genus—Cambarus. Now, the genus Astacus occurs in Japan, though not in South-Eastern Asia, Persia, Hindostan, Arabia, Syria or Africa. The connexion between the faunas of Japan and the Pacific coast of North America thus established is most interestingly borne out in the close relations which botanists have recognized between the floras of these two regions." This must be *Botanical News*, at least to the compatriots of Dr. Asa Gray.

§ 22. **Publications received.**—1. Vick's Floral Guide, 1880. James Vick, Rochester.—2. Aculeate Hymenoptera of North-western Kansas.—3. Generic Arrangement of the Bees allied to Melissodes and Anthophora.—4. The American Bembecidae; Tribe Stizini. All three by W. H. Patton, and extracted from the Bulletin of the Geological and Geographical Survey under F. V. Hayden, Washington, Nov. 30, 1879.—5. Science Advocate, Vol. I, No. 1. Henry A. Green, Editor. Issued quarterly by the Natural Science Society of Ateo, N. J.—6. The Naturalist's Quarterly, Vol. I, No. 1, Jan., 1880, Naturalist's Bureau, Salem, Mass., [apparently to take the place in Salem, vacated by Cassino].—7. A condensed List of a few of the most desirable Microscopes of moderate cost. R. & J. Beck, London and Philadelphia.—8. Arnold Puetz's Catalogue of Rustic Work, Plants, etc., Jacksonville, Fla.—9. Luther Burbank's Price List of Trees, Plants, Seeds, etc., Santa Rosa, Cal.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VII.] New York, March, 1880. **[No. 3.**

§ 23. **Proceedings of the Torrey Club.**—The regular monthly meeting of the Club was held at the "Herbarium," Columbia College, March 9, the President, Dr. J. S. Newberry, in the Chair. There were present 18 members and 2 visitors.

Mr. Britton exhibited several specimens of the fruit of the Chocolate tree (*Theobroma Cacao*), consisting of pods of about the form and size of a thick cucumber, each containing several rows of large beans or seeds, which after being dried, roasted, and ground constitute the cocoa of commerce.

Mr. Leggett exhibited a number of the seeds of the edible pine (*Pinus edulis*), commonly known as "pine nuts," one of the main articles of food of the Indians inhabiting the regions in which they grow. The seeds are about the size of small kidney beans, and have a rich oily kernel contained in a thin shell. In favorable seasons these are gathered by the Indians in large quantities and sold to the people of New Mexico, Arizona, and the border settlements of Mexico. Dr. Newberry made some interesting remarks on this and other species of pines which bear edible fruit, and spoke at some length on the subject of some of the more peculiar conifers observed by him during his explorations in the West.

Mr. Le Roy called the attention of the members to a specimen of *Aspidium acrostichoides* in which the frond was very deeply bifurcated.

Dr. Newberry exhibited a Japanese botanical work, which, judging from the very beautifully executed plates, was devoted entirely to the order Compositæ.

Miss E. G. Knight read a short list of plants which she had observed in flower this season. According to her observations, made in Central Park, *Acer rubrum* and *A. dasycarpum* were in full flower on Feb. 14th; two willows (species ?) and *Corylus Americana*, Feb. 27th; *Symplocarpus foetidus*, March 1st; *Populus grandidentata*, March 5th; *Ulmus Americana*, *Cydonia Japonica*, and *Forsythia viridissima*, March 6th.

Mr. Bicknell, from observations made at Riverdale on the Hudson, made the following additions to the above list: *Alnus incana* and *A. serrulata* in flower Feb. 29th; *Draba verna*, March 1st; and *Taraxacum Dens-leonis*, March 4th. Mr. Bicknell also stated that the *Symplocarpus* was observed by him in flower at Riverdale on the 29th of February, and was then being visited by large numbers of bees. According to records kept by members of the Club as to the flowering of the foregoing plants in past years, the present season is just 35 days in advance of any that have preceeded it.

Miss Jane T. Meigs, and Mr. B. B. Chamberlin, both of New York City, were elected active members. One new name was proposed for membership.

Mr. Braman read a communication from Mr. Frank Tweedy, consisting of some valuable and interesting "Notes on the Flora of Plainfield, N. J." After a discussion of this paper, Mr. Britton read a communication from Mr. H. H. Rusby, entitled "Notes on a Botanical Trip Through Northern New Jersey." Like the former, this paper contained very many valuable items of interest in regard to new stations for rare plants, and gave rise to considerable discussion. An abstract of both papers will be found in this issue of the BULLETIN.

§ 24. **Notes on the Flora of Plainfield, N. J.**—About a mile west of Plainfield, N. J., is a long and generally abrupt range of hills, trending to the northeast, and varying from 300 to 600 feet in height. This elevation, composed mainly of trap rock, forms a part of the triassic formation, and is known as "First Mountain" in the geological reports of the State. At Plainfield a deep gap occurs, through which flows Stony Brook, and on the slopes of this depression and in its immediate vicinity a number of interesting plants are to be found. On the northeast side of this gap, near the top, grows *Cheilanthes vestita*, Swartz., on a small ledge of trap rock, the plants covering an area of several square yards. I have collected specimens here that had some of the fronds branched near the apex. Here also with Cheilanthes grows *Opuntia vulgaris*, Mill., [?] the only locality for it that I have yet discovered near Plainfield. At the base of the ledge occurs *Phlox pilosa*, L., and about half way down the descent towards Stony Brook, *Zizia integerrima*, DC., is quite abundant. Along the stream *Clematis verticillaris*, DC , grows sparingly. This species I have found in large quantities, some 3 miles north of Plainfield on the same range of hills, growing with *Sambucus pubens*, Mich., on the western slope, rooting in rich black mould among masses of trap boulders.

Crossing Stony Brook and ascending a few rods, *Camptosorus rhizophyllus*, Link., can be found growing abundantly on low outcropping ledges of trap rock in the shade of a hemlock grove. It would seem, as Mr. Davenport remarks, that this fern is not by any means entirely confined to limestone formations. Fronds with auricled bases and irregularly sinuate margins are not uncommon at this locality, but the most singular abnormal form that I have collected is one in which the midrib of the frond forks just above the base, and, widely diverging, forms a twin or double frond, each bearing fruit dots and rooting from the two apices. With Camptosorus grow in profusion *Polypodium vulgare*, L., *Aspidium marginale*, Swartz, and *Asplenium Trichomanes*, L. At the base of the rocks and in the crevices between them the soil is kept constantly wet by the drainage from the higher land above, and here can be found several plants common to swamps and low ground, including *Trillium erectum*, L., and *Allium tricoccum*, Ait.

Passing up the ascent a short distance, *Viola rostrata*, Pursh., can be found growing abundantly in rich thickets, through which are scattered *Morus rubra*, L., *Ulmus fulva*, Michx., and *Corylus rostrata*, Ait. At this locality in July, 1875, I found *Aralia quinquefolia*, Gray. I have detected sparingly here also *Chamælirium luteum*. Willd., and *Melanthium Virginicum*, L. Further up the slope, in rather open woods, can be found *Cynoglossum Virginicum*, L., and near by, *Asclepias quadrifolia*, Jacq., and *Gnaphalium purpureum*, L. During the past season I found a second locality here for *Cheilanthes vestita*, Swartz, but it was not growing in any quantity. Quite a large patch of *Arabis lævigata*, DC., occurs on the eastern slope of the mountain, a mile north, and, near the summit, *Arabis Canadensis*, L. *Viola cucullata*, Ait., var. *palmata*, abounds on the summit and slopes near the gap, and it seems here to almost entirely replace the typical form. The leaves are very deeply parted, often nearly divided, and the whole plant is pubescent. The var *cordata* is not rare on dry open hillsides, has very short petioles, the leaves generally villous, purplish beneath, and lying flat upon the ground. *Viola sagittata*, Ait., is very common but varies greatly according to the soil. The form found in moist meadows has long petioles, arrow shaped or oblong-lanceolate smooth leaves, purplish beneath, and more or less cut-toothed at the base. In dry open woods the leaves are ovate-lanceolate and abruptly decurrent on the short petiole, the whole plant pubescent; this last form approaching the *Viola ovata* of Nuttall.

At the foot of the mountain, near Somerset street, in a small stream, *Orontium aquaticum*, L., occurs sparingly. Further down on Stony Brook *Echium vulgare*, L., is abundant. Here in June, 1876, I found a Thaspium with purple flowers which in some respects resembled *Thaspium barbinode*, Nutt., but Prof. Gray identified it as *Thaspium trifoliatum*, var. *atropurpureum*, T. & G.

On the bank of Green Brook, a mile southwest of Plainfield, occurs a large staminate tree of *Negundo aceroides*, Moench. It is about 30 feet in length and nearly two feet in diameter at the base. Two miles south of Plainfield in a shallow pond in sandy soil grows *Utricularia inflata*, Walt., abundantly with *Glyceria pallida*, Trin., and *Proserpinaca palustris*, L. During Dec., 1878, in a swamp near New Brooklyn, I found a *Lemna* growing in abundance which appears to be *Lemna Valdiviana*, Phillipi, and near it can be found *Heteranthera reniformis*, Ruiz. & Pav. In woods near Park Ave., two miles south of Plainfield, occurs *Asarum Canadense*, L., and *Conopholis Americana*, Wallroth, the latter sparingly; and near by can be found *Lonicera parviflora*, Lam., and *Lonicera sempervirens*, Ait. In Cedar Brook, near Park Ave., *Potamogeton crispus*, L., and *Ranunculus aquatilis*, L., var. *trichophyllus*, Chaix., are very abundant—the former so much so as to choke up the stream. With these grow *Nasturtium officinale*, R. Br., *Veronica Americana*, Schweinitz, and *Myosotis palustris*, Withering, var. *laxa*, Gray.

Sisymbrium Thaliana, Gaud., occurs sparingly in a field near Evona. *Stellaria longifolia*, Muhl., is common in swamps and meadows. *Symphytum officinale*, L., and *Muscari botryoides*, Mill., can be found rather common in meadows around dwellings. *Woodwardia angustifolia*, Smith, grows in a swamp on Short Hills, and *Phalaris Canariensis*, L., sparingly along roadsides. *Bromus sterilis*, L., is abundant in Plainfield, on Grove street. *Cynthia Virginica*, Don, is common in dry meadows along Cedar Brook. *Gentiana Saponaria*, L., and *Gentiana crinita*, Froel., are common, the latter especially so on the wet open summit and slopes of the mountain. *Pentstemon* *pubescens*, Solander, abounds in dry fields, and *Magnolia glauca*, L., in a swamp a mile south of Plainfield.

PLAINFIELD, N. J. FRANK TWEEDY.

§ 25. **Notes on a Botanical Trip Through North-western New Jersey.**—If the first year's work of the North Jersey Botanical Club resulted in nothing better, it infused a certain amount of enthusiasm for collecting, into the hearts of many persons to whom the feeling was before unknown. The result of this was the organization of a number of prolonged excursions. One of these, undertaken by two of the prominent members of the above club, and the writer, left Montclair on the afternoon of Aug. 13th, 1879.

The start being made, our road lay through Verona and Pine Brook to Parsippany, where the first event was the discovery of *Glyceria Canadensis*, Trin. A little farther on was found *Ranunculus alismaefolius*, Geyer, in abundance. Passing through Drakesville and Shippenport, the only interesting plants found were *Melanthium Virginicum*, L., *Habenaria psycodes*, Gray, and *Potentilla fruticosa*, L. Those not familiar with the latter plant can form no idea of the appropriateness of its specific name. In the northern counties of New Jersey it frequently covers the low grounds with such a dense and *hard* growth, as to render the passage across a field of a few acres of it very wearisome. The magnificent growths of *Epilobium angustifolium*, L., were also remarkable.

At Lake Hopatcong several days were passed. Here we saw *Polygonum amphibium*, L., var. *terrestre*, Willd., *Gratiola aurea*, Muhl., in abundance, and *Scutellaria galericulata*, L. We also collected fine specimens of *Sium lineare*, Michx., and *Brasenia peltata*, Pursh. *Corylus rostrata*, Ait., was abundant in the vicinity. But the most interesting plant found here, and which I think has not been noted heretofore, was a species of *Sagittaria*, probably *S. graminea*, Michx., with flowers varying from white to quite a dark purple, the petals having very firm texture.

At Blairstown we collected two or three specimens each of *Corallorrhiza innata*, R. Br., and *C. multiflora*, Nutt.

Crossing the Delaware river at Colombia, we went directly to the Water Gap. On the mountain sides we found *Cornus circinata*, L'Her., in fruit, in which state were also *Rhododendron maximum*, L., and *Hydrangea arborescens*, L. On the banks of Broadhead's creek, just above the Gap House, we found both species of *Apocynum*, *Elymus Canadensis*, L., var. *glaucescens*, Gray, and a species of *Avena* which we thought was *A. Smithii*, T. C. Porter. As the only specimen of the latter was lost, it must be left for some future collector to determine. The only other plants worthy of note were *Cenchrus tribuloides*, L., and *Verbascum Lychnitis*, L.

We next proceeded through Blairstown to Hardroicke. It was between the latter place and Stillwater that we first found those beautiful and delicate ferns, *Pellæa atropurpurea*, Link., and *Asplenium Ruta-muraria*, L., which afterward became so common on the cliffs, the graceful little *Asplenium* almost invariably filling the crevices, and edging the ledges on which grew its taller and more stately neighbor.

At Middleville we struck Swartzwood Lake and felt that we were fairly in for a few days solid enjoyment. Nor were we disappointed, as it is one of the most delightful spots for the botanist. The great profusion of *Nymphœa*, *Nuphar* and *Brasenia*, in their deep setting of *Nesœa*, is probably the chief feature of the locality. We secured a boat and in eager haste put off for "Nelumbium Inlet," at the northern end of the lake. While still half a mile distant, one of the party pointed out a long elevated line of green as being the *Nelumbium luteum*, Willd., the ultimatum of our journey; but the others were doubtful, on the ground that the leaves of the plant should rest upon the water. At last we discovered the individual leaves, then the petioles and finally a flower, and speculation was at an end. We saw before us in all its splendor this queen of the northern aquatics. Elevated from one to three feet from the surface of the water was this miniature yet majestic forest of leaves. Some that we measured were over two feet in diameter and almost perfectly circular, and it was only by careful selection that we succeeded in getting leaves small enough for herbarium specimens. A curious feature that attracted our attention was a narrow oblong figure stretched entirely across, and through the centre of many of the leaves. We finally discovered the cause. The leaf, before expanding, presents the appearance of two rolls, one on either side of the petiole, thus leaving a portion of the centre exposed to different conditions from the rest of the leaf. It is well for collectors to make a careful selection of a boat, and to go in force, for it is nearly impossible for one or two persons to penetrate beyond the extreme margin of the growth.

On the eastern shore of the lake we first found *Camptosorus rhizophyllus*, Link., and *Taxus baccata*, L., var. *Canadensis*, Gray. We learned from a farmer that *Phalaris arundinacea*, L., was much esteemed for fodder in this region; if cut early, two good crops being annually obtained. Before leaving this place we collected *Schollera graminea*, Willd.

Several fine specimens of *Asplenium ebenoides*, R. R. Scott, were found at Newton, which was perhaps the most interesting incident of the trip; it grew in company with *A. ebeneum*, Ait., and *Camptosorus*, and its appearance certainly favors Berkeley's opinion that it is a hybrid between these species.

At Ogdensburg we found *Mimulus alatus*, Ait. Returning home by way of Stockholm, Pompton and Little Falls, the only note-worthy discoveries were those of *Gerardia pedicularia*, L., and *G. quercifolia*, Pursh., and of *Lobelia Kalmii*, L., which were found near Stockholm.

HENRY H. RUSBY.

VERONA, N. J., Feb. 1880.

§ 26. **Additions to the U. S. Phalloidei.**—I have been informed by Mr. C. H. Peck, since the issue of the January number of the BULLETIN, that New York State should have been given as a habitat for *Clathrus cancellatus*, L., the plant having been detected near Buffalo, by Judge G. W. Clinton. This is a very interesting discovery since it authenticates the reported occurrence of the fungus in this country. Schweinitz (on whose authority it was inserted in my list) had not himself found the plant, but published it in his Synopsis on the faith of a drawing sent him by Leconte. Mr. J. B. Ellis writes me, too, that from Texas he has received *Laternea triscapa*, Turp., and a species of *Lysurus* which he deems new, and calls provisionally *L. Texensis*. *Laternea triscapa*, I believe, has hitherto been found in the Western Hemisphere, only in Chili and St. Domingo. On the other side of the globe it occurs in the East Indies. Diligent search on the part of collectors may reveal in Texas the presence of *Clethria crispa*, Turp., which is known to inhabit Mexico. In the "Medical Repository" for 1808, in which Rafinesque gave a proem to his contemplated revolutionizing of the American flora, he characterized, under the name of *Colonnaria*, a genus of the fungi, which was apparently the same as what is now known as *Laternea*. He describes it thus: "Divided into four pillars united at the top, which bear seeds in the margin." What he had in view was evidently what is now called *Laternea columnata*, Bosc.; unable, however, to restrain his natural propensities he made several species out of it, such as *urceolata*, *truncata*, etc. If my surmises are correct in regard to the identity of this Rafinesquian genus with Bosc's plant, the latter then has a range as far north as Philadelphia at least. Another genus of the *Phalloidei* proposed by Rafinesque was *Ædycia*, which evidently was what Berkeley and Curtis have since distinguished as *Corynites*, which, by the way, does not seem to possess very strong claims to be regarded as different from *Cynophallus*, or *Mutinus*. The genus is thus characterized by Rafinesque:—"Tubular, perforated at the top, gelatinous composed of utriculs (*sic*) containing the seeds." The species *rubra* was "cylindrical, reddish, the top covered with a brown mucilage." Our author had also observed (or rather he *said* he had) a species which was entirely white, and which he names *alba-fusiform*. "Both species," he remarks, "have a most intolerable stinking smell." By Mr. H. W. Ravenel I am informed that the *Corynites brevis* inserted in my list is merely the first Ms. name for *C. Ravenelii*, and was probably printed thus in Dr. Curtis's catalogue by an oversight of the author.

Before leaving this subject I must allude to an interesting matter connected with these plants, and one which, although it may have attracted the notice of others, I have never met with in print. I refer to the curious

§ 27. **Correlation Between the Odor of the Phalloids and their Relative Frequency**.—I do not wish to occupy space in the BULLETIN with matter, which without explanation, would prove intelligible to but few, and may therefore be excused for entering upon some preliminary remarks in regard to the structure of these fungi, and which, although they may appear trite to the mycologist, will serve to make the subject of more interest to the general reader. One of the six families into which Fries divides the fungi is that of the *Gasteromycetes*. The characteristic of this family is, that the plants which compose it have their hymenium or spore-bearing portion enclosed in a volva or wrapper, making them truly angiocarpous. One of the orders of this family (the *Trichogastres*) contains genera whose species are commonly known as "puff-balls"—objects which are so familiar to everybody that they need no very extended description. If a common puff-ball (*Lycoperdon*) be broken open at an early stage of its growth, the internal fleshy substance will be found to be firm and of a creamy whiteness. An examination of a very thin section of this whitish substance under a high power of the microscope will show that it is composed of closely compacted anastomosing threads, with here and there an irregular sinuous cavity lined with closely crowded club-shaped bodies (basidia) each tipped with from four to six spicules, and each spicule bearing at its apex a globular spore. When the spores are fully matured they become brownish and free, the hymenium is resolved into dry threads, and both together form a pulverulent mass. Next, the peridium bursts at the apex; and it then requires but the least touch from some passing animal, or even a slight pressure of the wind on the thin peridium to set free, in a single "puff," millions of the microscopic spores, which are thus disseminated far and wide. All this is very simple. Another order of the family is that of the *Phalloidei*, which, from the form and odor of a well-known species, is sometimes designated, with more truth than elegance, the "stink-horn" tribe. Here we have a structure analogous to that found in some of the puff-balls, but with a few important variations. In these fungi the volva or peridium is composed of three coats: an outer, thick white membrane; an inner, thin white membrane, and, between the two, a thick gelatinous layer. The hymenium or spore-bearing surface, enclosed within the inner membrane, is similar in structure to that of the puff-balls, and consists of a dense mass of threads presenting sinuous cavities lined with spore-bearing basidia. In these plants, however, the hymenium, instead of drying up into a dusty mixture of spores and threads, becomes moist, and then deliquescent; and, at maturity, drips away in a thick tenacious mucilage. It is evident, therefore, that were no method provided for their dispersion, the spores would simply flow down into the lower cavity of the volva, and there dry up into a hard mass; and that the plant would not only become local, but, in the struggle for existence constantly taking place in the organic world, would run the risk of extermination. Nature, however, has made a provision against such a calamity. On examining a section of the volva of one of the phalloids, we find that, according to the genus, the hymenial substance either surrounds the upper and external portion of a stem; or is enclosed in a network at the top of a stem (January BULLETIN, Pl. 1, Fig. 3); or is enclosed within stellate rays at the apex of a stem. In all cases, this stem is composed of large pits or cells, which, while the plant is still enclosed in the volva are very strongly compressed (See same Figure); but as the plant goes on maturing these cells acquire a rounder or more elongated form (Fig. 5, same plate), till at length their upward tendency is so strong that the volva is ruptured (sometimes with a loud report) and the hymenium is lifted to a height of several inches in the air. In the fungi of this order which have no stems (as in *Clathrus*) the network of the receptacle has the same cellular structure, and has precisely the same effect in bursting the volva and lifting the sporiferous mass into the air. One step is thus taken towards spore dispersion, but this is not enough, and the plant must needs have some extraneous aid; and furthermore, any such aid must come quickly, inasmuch as these fungi by reason of their loose cellular structure are quite short lived. Now one of the most prominent characteristics of nearly every species of this order is that the sporiferous substance has a most abominable, fetid odor—one that can only be compared with that emitted by putrescent animal matter. In fact, so similar to decaying animal organisms is it, that even flies are deceived thereby; and before the ill-scented mass has had time to drip away it will have been greedily devoured by numbers of these insects. As flies have "no local habitation" they give the minute ingested spores a wide dissemination by means of their ejections. It is a well-observed fact that the very common species of "stink-horns" (*Phallus impudicus*, *indusiatus*, etc.) are found in the greatest abundance around human habitations, where they occur under porches, in the door-yard, and in the garden, and often in such numbers, and so frequently as to occasion serious inconvenience. This tendency to become domesticated is thus correlated with their fetid odor and the presence of those constant companions of man—the flies. More rarely, these malodorous plants are found in woods in the vicinity of villages and cities. In such localities, where flies are less abundant, the same office is often performed for them by other insects—especially by beetles. The only fresh specimen of a *Phallus* that I ever met with in the woods was being visited by several individuals of a common species of carrion-beetle—*Silpha Noveboracensis*. A writer in the *Science Gossip* for Nov., 1879, mentions a case observed by him where a stink-horn "had its cap almost denuded of the dark slimy mucus which covers it by swarms of ants, which were busily engaged upon what appeared to be to them a dainty feast." There is thus evidently something in the composition of this sporiferous substance which proves grateful to the taste of such flesh-eating insects as are attracted to it by its cadaverous odor. Braconnot, as the result of an analysis of this fetid slime, states that it is composed of "highly animalized fungin, albumen, mucus, superacetate of potash, and of a peculiar acid in combination with potash." It follows from what has been said that those species of these plants which possess the most putrid odor ought to be the commonest and most widely distributed ones. This, as far as observation can be made on the comparatively few species that occur in the temperate zones, is what we find to be the case. Those species, on the other hand, that do not possess a powerful odor tend to become rare. Thus, for instance, *Cynophallus caninus* is nearly odorless. It has a wide range, being found both in Europe and America, but it is recorded in all the books as being extremely rare and local. In the 10th volume of the British Entomology, Curtis figured a peculiar species of *Phallus* which he states was exhaling a faint odor of violets. On this figure Mr. Berkeley has founded a species and called it *P. iosmos*. This plant, although it has been carefully searched for, has never been found a second time. Has it become extinct from not offering an odor attractive to carrion-eating insects? Throwing out such species as have been founded on indifferent figures, and not on the plants themselves, the number of good species of this order which have been described is probably less than seventy. Of these, two-thirds, as far as known, do not occur outside the tropics, and most of them have been described from one or two specimens collected by exploring expeditions, or individual explorers. It is thus impossible to obtain facts relative to their distribution. In the majority of cases, however, where any allusion is made to their odor, they are stated to be extremely fetid, and it is usually recorded of such species, too, that flies were observed eating their ill-smelling hymenium. In the cases of one or two Javanese species we are told that they were found growing on bamboo in the vicinity of the cottages of the natives. In some of these tropical genera the forms are extremely elegant; and especially is this the case in the genus *Aseroë*, the receptacle of which is divided into beautifully stellate, brilliantly colored rays. In most of the species of this genus the loathsome sporiferous substance is comparatively small in quantity, and in order to ensure of this being dispersed by insect agency, it would seem that this lack of quantity were compensated for by the bright conspicuous colors and the attractive forms that the plants assume. I was once asked by a friend who brought me the unexpanded volva of a *Phallus* as the supposed cause of an intolerable stench which proceeded from beneath a porch in front of his house, and which had caused his family great annoyance: "What good are these things; and, having such a vile odor, why do they remind us of it by so persistently thrusting themselves beneath our very noses?" The first question, in the present state of our knowledge, would be difficult to answer. So far as we know, these plants are of no practical use to man—being fit neither for food nor medicine; and, from an æsthetical standpoint, the species of the temperate zones, at least, have little to recommend them to the sense of sight, as most certainly they have nothing to commend them to that of smell.

The second question, I think has been sufficiently answered; although, in connection therewith, I may repeat what has often been remarked before, that the fragrant odors or the vile smells possessed by plants have been assumed by the latter with no reference whatever to man's delectation or annoyance, but, on the contrary, that they may prove advantageous to the plants themselves. It was probably with a feeling (shared by so many) that all things have been created for man's benefit alone, that led Bernardin de Saint-Pierre to write: "Plants which exhale delicious perfumes are of low stature in order that man may respire them." But Saint-Pierre, in his conceit, overlooked the magnolias, the honey-locusts, and a host of other trees which bear their fragrant blossoms way up out of man's reach.

W. R. Gerard.

§ 28. **The North-Jersey Botanical Club.**—The regular monthly meeting of the North-Jersey Botanical Club, was held on Saturday, March 13th, in the High School building at Montclair. Twenty-four new members were elected. The following officers were chosen for the ensuing year: President, Henry H. Rusby; Vice-President, Miss H. Adelaide Shibley; Secretary, Walter M. Wolfe; Treasurer, George O. F. Taylor; Curator, Charles M. Davis; Executive Committee, the President and Secretary *ex-officio*, Chas. M. Davis, Randall Spaulding and Miss Nellie F. Bradford.

After the transaction of the regular business, at which it was resolved to purchase for the library Gray's Synoptical Flora of North America, and a set of the Pacific Railroad Reports, the Club went into session as a class and discussed the subject of "Leaves." A large part of the members being beginners in the study, these classes have been organized for their accommodation. The classes meet weekly, one in Montclair, one in Bloomfield, and the third in Orange.

Montclair, N. J. WALTER M. WOLFE, *Sec'ty.*

§ 29. **Botanical News.**—In a note published in the *Cronica Cientifica* (Barcelona) of Jan. 10th, a writer, Sr. Bofill, calls attention to a recently issued work by Sr. D. Estanislas Vayreda on the "Noteworthy Plants of Catalonia," in which the author asserts that the viscid secretion which invests the internodes of the stem of *Silene crassicaulis*, Willk. and Costa, (as also, to a less degree, those of *S. inaperta*, L., *S. nutans*, L., and a few other species) has the property not only of capturing such insects as come in contact with it (whence the English name "Catchfly"), but also of dissolving the soft portions of their bodies; and that these plants might therefore be considered truly insectivorous. Has it ever been noticed that our more viscid American species of "Catchfly" (*S. Pennsyvanicum*, for example) possess any such digestive properties?

The January number of the *Revue Mycologique*, which now includes in its scope the subject of lichenology, contains articles by the editor on *Rupinia Baylacii;* the *Peronospora* of the Vine; an Unexpected Occurrence of the White Variety of *Cantharellus aurantiacus; Agaricus campestris* and its Numerous Varieties; the Anomalies exhibited by *Agaricus acerbus and equestris;* and a Revision of the "Reliquiœ Libertianæ." Dr. Passerini describes 18 new species of Italian fungi; Baron Thümen contributes a second decade of exotic fungi; and Dr. Müller gives an enumeration of all the Egyptian lichens that are known up to the present time. The remainder of the number is taken up with the bibliography of fungi and lichens. It would prove a great convenience to readers if M. Roumeguère should have his *Revue* stitched instead of issuing it, as at present, in loose sheets.

In the February number of the *Botanical Gazette*, Prof. Thos. C. Porter contributes a note on *Viola tricolor* var. *arvensis*, in which he urges that this plant has strong claims to be regarded as a native. In fact, the evidence in favor of such a view seems to be gradually increasing. We know of at least one New York station for this violet whither it is impossible that it could have escaped from a garden. Under the name of *Viola tenella* the plant figures in Dr. Torrey's list of plants collected by Dr. James during Long's Expedition to the Rocky Mountains in 1820. It was found growing along the Missouri in a district of country which at that early period must have been a wilderness. The other original notes in the *Gazette* are on *Lepidium campestre*, by Rev. S. Lockwood: on *Asplenium Bradleyi*, by Prof. F. L. Harvey: Bursting of the Fruit of *Euphorbia corollata*, by W. C. White; and a Reply to Mr. Meehan's Criticisms, by M. E. Jones. In these notes Mr. Jones modifies his opinion expressed in a former number, that *Malvastrum coccineum* proves poisonous to sheep which eat it.

The question as to how long the seeds of different plants preserve their vitality when buried at considerable depths in the soil is one that has been much discussed but not sufficiently investigated ; and facts bearing on this subject are therefore always of interest. In a recent number of the *Garden* a correspondent gives an instance which came under his notice, in which the seeds of several species of *Solidago* apparently remained dormant for twenty years. The ground had been covered with shrubs and carefully kept free from weeds during that time ; at its expiration the ground was cleared, and two years afterwards it was covered with specimens of *Solidago* three or four feet in height.

In an interesting paper on "Changes in Plant Life on the San Francisco Peninsula," read before the San Francisco Academy of Sciences, Feb. 2d, by Dr. Herman Behr, and published in full in the *Mining and Scientific Press* of Feb. 21st, the author points out the fact that in 1850 there were three original types of landscape which could well be distinguished on the peninsula. After enumerating the plants which characterized these three types, he goes on to state that the latter are now no longer distinguishable, the improvements of a growing city having brought them all to the same level. The original arborescents have been cut down partly for fuel, and partly to make room for houses. Horticulture has replaced them with the conifers of the Sierras, and the evergreens of Australia, The vegetation of the peninsula is at present more Australian than Californian. But it is not only the quick growth of the city, the sudden change of grade, etc., that have disturbed the original equilibrium in nature, for there still exist places enough where an original vegetation could have remained undisturbed, and where it was protected even against the attacks of domestic animals. One of the most powerful agents in the destruction of the original flora is the invasion of foreign plants. Parallel with the artificial introduction of Australian arborescents has come an immigration of herbaceous plants from Europe and Africa, against which the native vegetation has very little power of resistance. "First of all;" says Dr. Behr," I mention *Silybum Marianum*, a native of the Mediterranean region, observed by me the first time in 1854 in California, and in 1848 in South Australia. Wherever it gets a hold of the soil all native vegetation disappears. California is not the only land infested by this thistle. I have witnessed the same invasion in Australia, and have read the statement of my former teacher, Prof. Burmeister, at present in Buenos Ayres, that the same thistle protects, at the time of its vegetation, the settlers against the inroads of the Pampas Indians, as even the wild horsemen cannot cross the immense thickets formed by this plant." Another weed, *Cotula coronopifolia*, does the same work in moist ground as that begun by the *Silybum* in the more arid tracts of soil. This plant is a native of Africa, and made its appearance in California about 1854. This weed has transformed the varied aquatic vegetation of the places infested by it into one monotonous green mass with yellow buttons. The graceful floating *Azolla*, which formerly ornamented the creeks is scarcely to be found any more. Both of these foreigners, which may be called "the coming plants," belong to the Compositae, an order characteristic of the most modern flora. "Now it appears that in the fight for existence the junior sons of creation have a decided advantage; and this accounts for the otherwise inexplicable circumstance that the variety of organisms decreases so perceptibly when we enter the realms of Gymnosperms, vascular Cryptogams, and all those forms of organic life that existed already in the early periods of the earth."

The last numbers received of the *Botanische Zeitung* (Nov. 5 and 6) contain an illustrated paper by F. Hegelmaier "On the Embryogeny and Development of the Endosperm of Lupinus."

In the *Comptes Rendus* of Jan. 12 (p. 58) will be found an interesting and useful paper on the "Evolution of the Inflorescence in the Gramineae," by M. H. Trécul.

The *Journal of Botany* for February has the following table of contents: John Miers (with portrait), by W. Carruthers, F. R. S.; Alabastra diversa, by S. Le. M. Moore; Notes on the Flora of Northamptonshire, by G. C. Druce, F. L. S.; Two Additions to the British Moss-list, by H. Boswell; Two New Bromeliads from Rio Janeiro, by J. G. Baker, F. R. S.; Hampshire Botany, by F. Townsend, F. L. S.; and Notes on the Botany of the British Polar Expedition of 1875-6, by H. C. Hart, B. A.

The *Contemporary Review* for February contains an interesting and instructive article by Prof. St. George Mivart on the "Geography of Living Creatures." It seems rather odd to an American botanist to see *Ampelopsis quinquefolia* classed among trees, as it is in this article; and it is rather curious, too, to see the persistency with which some of our English cousins cling to that genus "Wellingtonia," when they have occasion to refer to our big California trees —the *Sequoiae.*

Hardwicke's *Science Gossip*, which is always interesting to the naturalist, treats of the following botanical subjects in the February number: "Some Probabilities Respecting Organic Species," by W. S. Palmer; "Notes on Phyllotaxis" (illustrated), by H. W. Syers; and "Primroses and Violets," by R. M.

The *American Monthly Microscopical Journal* for February contains an article by Dr. F. Wolle in which he points out the fact that the fresh-water algae are quite often the subjects of pecular transformations in the course of their life-history. To aid the beginner in his studies the author, in this short paper, explains some of the fallacious appearances that are likely to be met with among these cryptogams.

§ 30. **Juncus setaceus,** Rost.---I have received specimens of *Juncus setaceus*, Rost., from Norfolk, Va., collected by Mr. H. P. Worcester. This is, I believe, the most northern authentic station reported for this rush, the Pennsylvania locality of Rostkovius being questioned in Gray's manual. N. L. B.

§ 31. **Errata.**—In the February number, there occurred the following typographical errors, which should be corrected as follows: 1st page, line 17, insert "as if," after "seemed"; line 38, read "evolution"; p. 17 line 15, insert "here" after "we"; p. 22, line 47, for "Tübigen" read "Tübingen"; p. 23, line 29, "substraction", set up thus by the printer in a moment of abstraction, should be "subtraction."

BULLETIN

OF THE

TORREY BOTANICAL CLUB.

Vol. VII.] New York, April, 1880. [**No. 4.**

§ 32. **Proceedings of the Torrey Club.**—The regular monthly meeting of the Club was held at the "Herbarium," Columbia College, Tuesday evening, April 13, the President, twenty-eight members, and eight visitors being present.

Mr. Leggett announced the death of Mr. C. F. Austin, an esteemed member of the Club, and called attention to the destitute condition of his family. On motion it was resolved to purchase from the widow a set of the *Musci Appalachiani* and *Hepaticae Boreali-Americanae.*

Mr. Britton of the Herbarium Committee announced the receipt from Mr. A. Brown of 250 specimens of ballast plants, collected in New York city and vicinity.

Prof. D. S. Martin exhibited and remarked upon a section of the trunk of a tree fern. Remarks upon the structure of the same were also made by Mr. Jos. Schrenck.

Prof. A. Wood exhibited the fruit of *Rhus diversiloba*, T. & G., from California, and of *Sapindus marginatus*, Willd., from Southern Kansas—the latter being a hitherto unreported habitat for this plant.

Dr. Kunze exhibited a specimen of *Eucalyptus globulus*, consisting of leaves and flower buds, and made explanatory remarks thereon.

Mr. Gerard exhibited a monstrous specimen of *Sophora Arizonica*, Wats., from Texas, in which the peduncle was flattened and spread out in a fan-like manner at its extremity.

Mr. Bicknell read a paper entitled "Notes on the Flora of Riverdale, N. Y."

Prof. D. S. Martin read a communication from Mr. Jno. M. Batchelder, of Boston, on the "Influence of Electricity upon the Growth of Plants." The author sowed "pepper-grass" seeds on cotton floating on the surface of distilled water contained in two tumblers. One of the tumblers was insulated, and in it was placed a coiled copper wire the other extremity of which communicated with a revolving belt. Both tumblers were placed under the same conditions of light and heat. It was found that the electricity retarded both the germination of the seeds and the subsequent growth of the plants to a remarkable degree. At the conclusion of his experiments Mr. Batchelder discovered that while the roots of the plants in the non-electrified water were growing normally, those submitted to the action of electricity were twisted and coiled in an intricate manner among the fibres of the cotton.

Prof. A. Wood read a paper on "Some Points in Botanical Terminology" wherein he advocated that the terms ordinarily in vogue to designate the venation of leaves should, for philosophical reasons, be discarded; and that in their stead should be substituted the term "midvein" for the principal axis of venation, or prolongation of the petiole; "veins" for the divisions (if any) of the petiole; "veinlets" for the primary branches sent off from the midvein or veins; and "veinulets" for the secondary branches sent off from the veinlets.

Mr. Bicknell stated that the total number of plants observed by him in flower this year up to date was thirty-five.

Prof. Wood reported that he had received from Dr. E. C. Howe a specimen of *Carex Sullivantii*, Boot, collected near the Croton aqueduct at Yonkers.

M. W. Van Denburg, M. D., of New York City, was elected an active member, and two new names were proposed for membership.

§ 33. **Coe F. Austin**.—This well-known botanist died on the 18th of March, 1880, at his home, Closter, New Jersey, where he was born on the 20th of June 1831. His health had been failing for a year, but the close was rather sudden.

After completing his education at Rankin's Pinkerton Academy, Austin, who was endowed with the true mind of a naturalist, devoted his time to the study of Chemistry and Botany. Becoming soon most interested in Botany, he accepted the position of Curator of the herbarium of Columbia College, but abandoned it to give his whole time to the study of the Mosses and Hepaticae, and to the search for and collection of these plants.

Without a sufficient supply of books, but with an incomparable perseverance, he soon became an adept in this department of botanical science, and, helped by Sullivant and other American bryologists, he was able to prepare the publication of his first work on Mosses.

As a collector, Austin pursued his explorations with indomitable energy and remarkable success, enriching the American flora with a large number of species, either new or as yet undiscovered in this country. The first work of his, the *Musci Appalachiani*, is a collection of 450 specimens, raised to 550 by a supplement in 1878, representing above four hundred species, the rest being varieties not less valuable to students.*

Mr. Austin contributed in 1869, an article to the Proceedings of the Philadelphia Academy of Natural Sciences, containing 47 species of Hepaticae. After which time appeared his *Hepaticae Boreali-Americanae* which comprised 150 specimens, 30 of which were varieties, and 15 species previously published.

Work of this kind can be performed only by true devotion to science. It demands a prodigious amount of research in the field for procuring the specimens, and an arduous labor to separate the species, (for mosses mostly grow mixed together) and then for the determination of each specimen, which has generally to be done by microscopical examination. It is therefore easy to understand how much time has to be spent in the preparation of a single set, and what small material advantage can be derived from such undertakings.

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* This work is the more valuable since nothing else of that kind can now be obtained for American Bryology, as no copies of the *Musci Alleghanienses* by Sullivant, nor of the *Musci Exsiccati*, by Sulliv. & Lesqr., are left for sale. The few copies of the *Musci Appalachiani* which, if I am well-informed, have been left by Austin will soon be disposed of. The same remarks are applicable to his other important work—the *Hepaticae Boreali-Americanae*.

Austin's name is well-known by the readers of the BULLETIN, to which he has furnished the descriptions of 110 species of Mosses and Hepaticae. Sixty-four others have been published in the *Botanical Gazette.*

As an anatomist and judge of the character of the Mosses, Austin had a quick perception, but was often disposed to unreliable conclusions, formed too confidently on incomplete materials. He has, therefore, sometimes recalled his first determinations. But who is the bryologist who has done otherwise? A large number of his species, some of them the finest and rarest in the North American Bryology, stand as wonders of his clear discrimination, and he leaves a name dear to American botanists and well-known to European bryologists.

The loss of Austin is especially to be regretted for Hepaticology, of which he was the only representative in this country. He had studied the Hepaticae as his specialty, with the purpose of publishing a Synopsis, which time only prevented him bringing to completion.

L.

[Mr. Austin left sets of his Musci, and Hepaticae, all labelled and accompanied by a catalogue and index. His private collection contains very numerous specimens of each species, with his notes upon their various forms in different localities. It would be an invaluable aid in making critical researches in this field of enquiry, and should be acquired by some scientific institution. Those who make a study of these subjects ought to be prompt in procuring sets, both for their own sakes and for the sake of the family of this devoted scientific worker. The prices are given in the advertising page of this sheet.]

§ 34. **The Genus Pinus.**—*Revision of the Genus Pinus and description of Pinus Elliottii, by Dr. George Engelmann,* from the Transactions of the Academy of Science of St. Louis, February, 1880, with three beautiful plates illustrating P. Elliottii, drawn on stone by P. Roetter.

With indomitable courage, patience and skill, Dr. Engelmann attacks one after another the Doubting Castles of Botany and generally succeeds, if not in utterly demolishing them, at least in opening to the light their most gloomy dungeons. Mr. Bebb will probably claim that Salix offers a more stubborn and more extensive obstacle than Pinus, but the latter was far enough from being reduced, before Dr. Engelmann sat down before it. It is claimed that the present arrangement is as natural a one as any that can be devised, and that by it, to some extent, even geographical alliances are best preserved.

Dr. Engelmann finds, "with Endlicher, the most valuable character in the fruit scale," or, to speak more correctly, "that the fruit scale in this genus corresponds with a series of other characters which constitute two very natural sections of the genus" *Strobus* and *Pinaster*. The more or less thickened exposed part of this scale, called the apophysis, is rather depressed and terminates in a blunt point in *Strobus*; in *Pinaster*, it bears its point on the usually more thickened back, the *umbo*, mostly armed with a prickle or spur, sometimes early deciduous.

The subsections are distinguished by the position of the resinous ducts within the leaf. These ducts, normally two, but very often numerous, lie amid the chlorophyll-bearing parenchyma cells, between the thick epidermis and the sheath which surrounds the vascular bundles. When close to the epidermis the ducts are called *peripheral;* surrounded on all sides by the parenchyma, *parenchymatous;* close to the sheath around the vascular bundles, *internal* ducts. The use of this position of the ducts is the main new point in the present classification. It is believed to be constant and intimately connected with the essential character of the plant. The difficulties attendant upon its use are: *first*, that "in some few species smaller accessary ducts do occupy an abnormal position; *secondly*, that "in pines with very slender leaves it is sometimes difficult to discover the ducts," and in some forms perhaps they are really absent, especially in cultivated specimens; and, *thirdly*, that sometimes the parenchyma separating them from the epidermis or vascular sheath is so thin a layer that *parenchymatous* ducts may be mistaken for *peripheral* or *internal*. The other distinctions though mostly more obvious are less natural, only the presence or absence of hypodermal or strengthening cells is difficult of appreciation and of doubtful value. We proceed to give a somewhat abridged account of the arrangement, but of course the students of pines will not be satisfied with less than the complete monograph with all its details. Dr. Engelmann includes only such species or (sub-species) as he has been able to examine himself: "the list, however, will be found nearly complete." The numbers prefixed to the species are additions of our own.

SECT. I. STROBUS.

§ 1. **Eustrobi.**—Ducts peripheral. Northern or mountain species of the Old and New World.

* Wings longer than the seed.

1. P. Strobus, 2. monticola, 3. excelsa, 4. Peuce, 5. parviflora, 6. Bonapartea, 7. Ayacahuite, 8. Lambertiana.

** Wings much shorter than seeds.

9. P. flexilis, (10. albicaulis), 11. pygmaea.

§ 2. **Cembrae.**—Ducts parenchymatous—Europe and principally Asia.

12. P. Cembra, 13. Mandschurica, 14. Koraiensis.

SECT. II. PINASTER.

A. Ducts peripheral. *a.* Cones subterminal.

§ 3. **Integrifoliae.**—Leaves smooth-edged, their sheaths deciduous.—Western North America and Mexico.

* Cones short globose; scales unarmed; seeds large with a minute wing.—*Cembroides.*

15. P. Parryana, 16. cembroides, 17. edulis, 18. monophylla.

** Cones oval or elongated; scales armed; seeds much shorter than the wing.—*Balfouriana.*

19. P. Balfouriana, (20. artistata.)

§ 4. **Sylvestres.**—Leaves serrulate, their sheaths persistent.—Europe and Asia, one species in America.

* Leaves in threes.—*Indicae.*

21. P. Khasia, 22. insularis, 23. longifolia.

** Leaves in twos. Cones and seeds small; wings large.—*Eusylvestres.*

24. P. sylvestris, 25 montana, 26. resinosa, 27. densiflora, 28. Massoniana, 29. ? Merkusii.

*** Leaves in twos. Cones and seeds large; wings rudimentary. A single Mediterranean species.

30. P. Pinea.

b. Cones lateral.

§ 5. **Halepenses.**—Old World.

* Leaves in threes; sheaths deciduous; umbo very prominent; wings shorter than the large seeds. *Gerardianae.*—Asia.

31. P. Gerardiana, 32. Bungeana.

** Leaves in twos; sheaths persistent; cones smoothish; wings much longer than seeds. *Euhalepenses.*—Mediterranean regions.

33. P. Halepensis, 34. Pyrenaica.

B. Ducts parenchymatous. *a.* Cones subterminal.

§ 6. **Ponderosae.**—Mostly American with three Old World species.

* Leaves in fives; ducts usually free of strengthening cells; *Pseudostrobi.*—Central America and Mexico to Arizona and California.

35. P. leiophylla, 36. tenuifolia, 37. filifolia, 38. Pseudo-Strobus, 39. Montezumae, (40. Hartwegii), 41. Torreyana, 42. Arizonica.

** Leaves in threes, sometimes in fours or fives; sheaths persistent; strengthening cells under the epidermis, around ducts. *Euponderosae.*—Northwestern America, Mexico and Canary Islands.

43. P. Engelmanni, 44. ponderosa, (45. Jeffreyi), 46. Canariensis.

*** Leaves in threes; sheaths deciduous.—Mexico and Arizona.

47. P. Chihuahuana.

**** Leaves in twos. *Lariciones.*—Europe to Asia and W. America.

48. P. Laricio, (49. Austriaca), 50. Thunbergii, 51. contorta, (52. Murrayana.)

b. Cones lateral.

§ 7. **Taedae.**—Mostly American, only one Old World species.

*. Leaves in threes. *Eutaedae.*—North America to Mexico.

53. P. Sabiniana, 54. Coulteri, 55. insignis, 56. tuberculata. 57. Taeda, 58. rigida, (59. serotina), 60. Greggii. 61. Teocote. 62. patula.

** Leaves in twos; cones with very stout prickles. *Pungentes.*

† Ducts without strengthening cells.—North America.

63. P. inops, (64. clausa), 65. pungens, 66. muricata.

†† Ducts surrounded by strengthening cells.—Southern Europe.

67. P. Pinaster.

*** Leaves in twos, or in the first often also in threes; cones with weak or deciduous prickles. *Mites.*—Eastern North America.

68. P. mitis, 69. glabra, 70. Banksiana.

c. Ducts internal.

§ 8. **Australes.**—Leaves in twos to fives. Timber very heavy and resinous.—Southeastern North America, West Indies, and one species in Mexico.

* Cones subterminal; leaves in threes to fives. *Euaustrales.*

71. P. oocarpa, 72. occidentalis, 73. australis.

** Cones lateral or mostly so; leaves in twos to threes. *Elliottiae.*

74. P. Elliottii, 75. Cubensis, 76. Wrightii.

Notes.

Nos. 15–18. *Cembroides.* Dr. Englemann considers it an open question whether these four species may not properly be united into one.—19, 20 must be united.—21–23. a very natural group.—27. *P. densiflora*, Sieb. & Zucc., sometimes cultivated under the name of the following.—28. *P. Massoniana*, Lamb. Parlat., not Sieb. & Zucc., or Endlich., that is No. 50, *P. Thunbergii*, Parl.—29. *P. Merkusii*, Jungh. & De Vriese, with poor specimens the affinity of this species was not certainly determined.—34. *P. Pyrenaica.* Lapeyr. fide Parlatore, not to be confounded with 48, *P. Laricio*, Poir., as has been done, even by Lapeyrouse himself.—39. *P. Montezumae*, Lamb., species not sufficiently circumscribed.—43. *P. Engelmanni*, Carrière. Wislizenus brought a single specimen from the mountains west of Chihuahua.—46. *P. Canariensis*, Ch. Smith, perhaps more nearly related to *P. Laricio*, Poir. The articulation of the four involucral bracts is a curious feature which it has in common with our *P. resinosa*, Ait.—53. *P. Murrayana*, Balf., is only a broader leaved mountain form of *P. contorta*, Doug,—56. *P. tuberculata*, Gordon, not of Don, which is a form of *P. insignis*, Doug.—67. *P. Pinaster*, Ait., except by the position of the female ament, more nearly allied to *P. Canariensis*, less so to *P. Laricio.*—74. *Pinus Elliotti*, Engelm., imperfectly known to Elliott, was rediscovered about ten years ago by Dr. Mellichamp, and is here fully described and illustrated.

§ 35. **Fresh Water Algae, IV.**

The pursuit of my recreation, the natural history of Fresh Water Algae, has revealed to me, during the past year, new points of interest in the development and growth of a few, and brought to light, out of their hitherto hidden abiding places, many which previously had not been recorded as dwelling in our land.

The following list of upwards of one hundred plants, embraces at least ninety which are new to the United States Flora, and of which eighteen were wholly unknown. About fifty were collected in New Jersey. This State, which has won a wide reputation for its peculiar richness in phenogamous plants, also appears in the small portion thus far explored, to be richly stocked with cryptogams.

When the locality is not given in the list, it is to be understood that the plant was found in the vicinity of Bethlehem, Pa. Some were collected in the neighborhood of New York, and others in Massachusetts, Connecticut, Iowa, Florida, etc.

To the collectors whose names are mentioned, I return cordial thanks, alike for what they have done, and for their promises of further favors. I am happy also in having several new volunteers, who await the opening of the season to begin their explorations. To O. Nordstedt, of Lund, Sweden, I am especially indebted for valuable suggestions, and for many desirable extracts from his extensive library of botanical works.

FRANCIS WOLLE.

BETHLEHEM, PA., March, 1880.

PHYCOCHROMOPHYCEAE.

Oscillaria, Bosc.—O. subfusca, Vauch. Wet gneiss rocks.—O. Porettana, Menegh. Shaded limestone rocks.—O. tenuis, Ag. Dripping rocks. O. Grateloupii, Bory. Submarine waters, New York. Coll. R. Hitchcock.—O. subsalsa, Ag., *var.* dulcis, Ktz. Antigua, W. I. Coll. B. Romig.—O. natans, Ktz. Ponds, New Jersey.—O. Froellichii, *var.* phormidioides, Rabenh. Swartwout Lake, &c., New Jersey.

Phormidium, Ktz.—P. arenarium, Ag. Florida. Coll. J. D. Smith.

Microcoleus, Desmaz.—M. gracilis, Hass. Dakota, per Dr. Hobby of Iowa City.

Sphaerozyga, Ag.—S. Ralfsii, Thw. Ponds.

S. saccata, n. spec.—S. trichomatibus in thallis tubulosis, cylindrico-elongatis, simplicibus, decem plus minus aggregatis, unciam usque ad palmam longis, 2–3 lineas crassis, varie constrictis vel undulato-sinuosis, gelatinosis vel submembranaceis, mollibus, initio affixis, mox libere natantibus et multum contractis ; trichomatibus subrectis, paralleliter aggregatis vel leniter curvato-implicatis ; articulis oblongis, saepe subcylindraceis, aerugineis, arcte conexis ; sporis numerosissimis, cylindricis, sordide aerugineis, diametro 2–3–plo longioribus ; cellulis perdurantibus globosis vel ovalibus, articulorum diametro paulo vel duplo majoribus. Diam. art. 00016″–0002″. Spor. diam. 0003″ ; long. 0006″–0009″. Hab. in stagnis, New Jersey.

This plant was found freely distributed along the shores, and in the shallow waters of Cranberry Pond, N. J. It is peculiarly distinct in the cylindrical, vertical, sack-like growth of the thallus, one to three inches high.

Tolypothrix, Ktz.—T. Aegagropila, Ktz. Coll. J. S. Adam, Lime Rock, Conn.

T. bombycina, n. sp. T. castaneo-brunnea, trichomatibus pseudoramulisque leniter curvatis, laxe intricatis, elongatis, basi breviter concretis, internis brunneis ; modo distincte modo indistincte articulatis ; articulis subtilissime granulosis, diametro (.00048″–00055″) equalibus, vel duplo brevioribus ; vaginis arctis, luteolis, lævissimis ; cellulis perdurantibus, semper basilaribus, subglobosis, singulis, vel 2–3–seriatis.

Forms a dark brown silky stratum on wave-washed stones, along the shores of Hopatcong Lake, New Jersey. According to earlier authors this plant would be a *Calothrix.*

Gloiotrichia, Ag.—I have found a very singular form of propagation in a plant of this genus. The spore contents break through the base, enter into the heterocysts ; these enlarge, change color from yellowish to bright green, and thus become sporangia, which reproduce the gelatinous cysts in which the original form is developed.

CHLOROPHYLLOPHYCEAE.

Gloeococcus, A. Br.—G. mucosus, A. Br.

Dictyosphaerium, Naeg.—D. reniforme, Bulnh. Pond, N. J.—D. Ehrenbergianum, Naeg. Coll. R. Hitchcock, N. Y.

Caelastrum, Naeg.—N. sphaericum, Naeg. Ponds, N. J.

Ophiocytium, Naeg.—O cochleare, A. Br., Ponds.

Eudorina, Ehrb.—E. elegans, Ehrb.

DESMIDIACEAE.

Closterium, Nitzsch.—C. Lunula, Muller. Common but not heretofore noticed.—C. decorum, Breb. Not infrequent.

Pleurotaenium, Naeg.—P. coronatum, Breb.—P. Ehrenbergii, Ralfs.

Spirotaenia, Breb.—S. obscura, Ralfs. Ponds, N. J.

Sphaerozosma, Corda.—S. secedens, De By., Brown's Mills, N. J.

Cosmarium, Corda. The following were collected in ponds, partly in New Jersey and partly in Penn.—C. sinuosum, Lund. A small variety.—C. tumidum, Lund.—C. tinctum, Ralfs.—C. Smolandicum, Lund.—C. sulcatum, Nordst.—C. venustum, Breb.—C. polygonum, Naeg.—C. homalodermum, Nordst. A small form. Coll. H. S. Kitchell, Conn.—C. parvulum, Breb.—C. cruciatum, Breb.—C. Ungerianum, Naeg.=C. oligogongrus, Reinsch.—C. Ralfsii, Breb.=C. Meriani, Reinsch, *var.* pentagona, Nordst.—C. Turpinii, Breb.—C. Hammeri, Reinsch.— C. anisochondrum, Nordst.—C. Thwaitesii, Ralfs, *var.* Holmiense. Coll. R. Hitchcock, New York.

Euastrum, Ehrb.—E. affine, Ralfs.—E. Pokornyanum, Grun.—E. abruptum, var. evolutum, Nordst.—E. binale, *var.* insulare, Wittr.

E. Donnelli n. sp. E. mediocre, late ovatum, longius quam latius; medio profunde constrictum, sinu angusto lineari; semicellulis trilobis; lobis basilaribus, orbiculo-tumidis; lobo polari subito contracto (semi-diametro) sub-hemisphaerico; dorso subtruncato. Lobis singulis in margine cum mucronibus tribus vel quatuor armatis. Semi-cellulis singulis cum quinque tumoribus instructis; tribus in seriem simplicem transversam in inferiore parte, duabus in superiore parte. Cytiodermate subtiliter punctato. Diam. long. .00216″; lat. 0018″. Hab. Florida. Coll. J. D. Smith.

E. formosum, n. sp. E. mediocre, diametro subduplo longius, ovale; semi-cellulis sex marginalibus lobis, vel prominentiis; sinibus introrsum rotundatis; lobis in apice profundis trifidis, vel tridentatis; dente centrali recto, et lateralibus divergentibus; lobis inferioribus plus minus elementariis. Cytiodermate laevi. Diam. long. 0025″; lat. 0016″. Hab. Ponds, near Toms River, New Jersey.

Micrasterias, Ag.—M. mucronata, Dixon.—M. angulosum, Hantzsch.

M. Kitchellii, n. sp. - M. magna, circiter tam longa quam lata, sinu acuto, introrsum valde amplicato; semi-cellulis profunde trilobis; lobis basilaribus sub-conico-productis, oblique et late truncatis; angulis duobus spinis divergentibus armatis; lobo polari a lobis basilaribus sinu amplo ac rotundato discreto, vertice plus minus convexo, utrinque duabus spinis divergentibus armato. Diam. lobis basilaribus lat. .005″; lobis polaribus .003″. Cell. long. .005″.

The general outline of this plant is near *M. adscendens*, Nordst. found on the Sandwich Islands, but it is larger, the polar lobe is more exserted, and hence the sinuses between it and the basal lobes are much wider and deeper, broadly rounded, not "amplo-acutangulo." The angles are not bidentate, but are furnished with two diverging spines. Collected by H. S. Kitchell in a small pool adjoining Gelder's Pond, on Mt. Everett, Mass., about 1800 feet above sea level.

M. fimbriata, Ralfs, var. *nuda*, *n. var.* M. permagna orbicularis, laevis; lobulis lateralibus plerumque obtusis, emarginatis, praeter lacinulam sinui proximam quae est paulum conico-producta, in apice duabus spinis divergentibus armata.

The peculiarity of this plant is in the absence of the fimbriae, or spines, except at the angles of the polar lobe, and on the apex of the subdivision next the sinus between the semi-cells. Occasionally one or another of the small subdivisions has rudimentary points. Having examined 25 to 30 plants all bearing out the same character, it is deemed worthy of a record. Collected in the same habitat with the preceding.

Staurastrum, Meyen,—St. muricatum, Breb.—St. rugulosum, Breb. —St. scabrum, Breb.—St. cyrtocerum, Breb.—St. brachycerum, Breb.—St. tricorne, Menegh.—St. leptocerum, Nordst.—St. cuspidatum, Breb.—St. asperum, Perty.—St. pygmaeum, Breb. St. echinatum, Breb.—St. Arachne, Ralfs.—St. Sebaldi, Reinsch. These were collected in ponds in Eastern Pennsylvania, and in New Jersey, and were not noted in previous list. The following new forms are from the same districts.

St. pulchrum, n. sp.—St. parvum, cytiodermate laevi vel subtilissime punctato; semi-cellulis introrsum ventricosis, dorso plus minus arcuatis vel rectilinearibus undulato-crenatis : angulis in radium lanceolatum obtusum productis, a vertice pentagoneis, angulis radiatis; radiis hastatis, obtusis, inter basis sinu semicirculari. Diam. c. rad. .0015″–.0016″ Hab. in lacu, Brown's Mills, N. J.

St. Nova-Caesareae, n. spec. — St. mediocre, circiter tam longum quam latum vel paulo longius, granulatum, angulis in aculeos geminos validos subulatos longe productis ; semi-cellulis a fronte ellipticis, margine ambitu crenato-verrucosis ; a vertice quadrangularibus, angulis mammillatis, aculeo gemino imposito. Diam. sine aculeis, lat. .0015″–0016″ ; long. .0026″–.003″. Cum acul. lat. .0025″–0028″.

St. tricornutum, n. spec. St. magnum, tam longum quam latum, superficie laevi ; semi-cellulis late ellipticis, utroque fine in tres aculeos, achroos, diametro cellulis duplo breviores, divergentes, elongatis ; dorso tribus aculeis similibus armatis ; a vertice triangularibus, lateribus modo leviter concavis, modo paullum convexis, angulis in tres aculeos instructis. Diam. sine aculeis .0036″–004″ ; cum ac. .007″–008″.

St. macrocerum, n. sp. St. magnum, granulato-asperum, semi-cellulis introrsum ventricosis, dorso leniter rotundatis vel truncatis ; angulis in cornu rectum vel incurvatum provectis ; a vertice polygonis, sex-vel rarius septem-radiatis ; radiis elongatis, linearibus, achrois, apice trifido. Diam. c. rad. .0025″–0053″. Hab. in lacubus, New Jersey.

St. fasciculoides, n. sp. St. mediocre, dimidio circa longius quam latius, granulatum ; semi-cellulis ellipticis, dorso, rotundatis, ex ventre recte productis, et isthmum latiorem semi-diametro formantibus ; a vertice triangularibus ; lateribus plerumque rectis, margine prominentiis brevibus, apice 2–4 dentato vel cuspidato, munitis ; isthmo similiter armato ; angulis truncatis, aculeis duobus vel tribus, acute conicis, instructis. Diam. lat. .00116″ ; long. .0015″.

St. subarcuatum, n. sp. St. mediocre, granulatum, fere tam longum quam latum, medio profunde constrictum, sinu acutangulo ampliato ; semi-cellulis a fronte visis ellipticis divergentibus, quasi obverse lunatis, granulis in series transversas ordinatis ; angulis productis bifidis achrois ; dorso papilloso angustato producto, et late truncato ; semi-cellulis a vertice visis triangularibus; angulis rotundatis brevi mucrone imposito ; lateribus aut rectis, aut leviter concavis, in medio papillis ornatis, nonnunquam productis bifidis. Diam. .0013″–.0015″.

The nearest approach to this plant is a form found in Norway, and described by Mr. Nordstedt under the name of *St. arcuatum.* The papillae are sometimes distinctly seen arranged in a circle of which 4–6 present themselves as marginate ; these are sometimes elongated and bifid.

St. comptum, n. sp. S. parvum, granulatum, sinu amplissimo ; semi-cellulis subfusiformibus, dorso convexis, isthmo cylindrico plus minus elongato conjunctis, a vertice 6 radiatis ; radiis strictis, apice subtricuspidatis. Diam. lat. 00116″ ; long. 0015″.

St. pusillum, n. sp. S. perexiguum, oblongum, rectilineare ; sinu indistincto ; angulis in cornua divergentia productis ; a vertice quadrangulare ; angulis radiatim productis. Diam. lat. .0003″ ; long. .00055″ ; cum cornu duplo longiore.

Xanthidium, Ehrb. X. Antilopaeum, Breb. *var.* triquetrum, Nordst. Similar to a form found in Brazil.—X. Arctiscon, Ehrb.=Staurastrum Arctiscon, Lund.=St. munitum, Wood.

Arthrodesmus, Ehrb.—*A. fragilis, n. sp.* A. sublaevis mediocris, profunde constrictus ; aculeis subulatis strictis ; semi-cellulis subsphaericis, vel late ovalibus (lat. 0015,″ long. 0013″) utroque fine aculeo longo recto instructis ; aculeis plerumque deciduis. Diam. cum aculeis ad .0045″. Hab. in stagnis prope Hammonton, New Jersey ; Aug. 1879.

ZYGNEMACEAE.

Spirogyra, Link.—S. stagnalis, Hilse.—S. intermedia, Rabh.

Zygogonium, Ktz—Z. pectinatum, Ktz.

Zygnema, Ktz.—Z. leiospermum de By.

Pleurocarpus, A. Br.—*P. tenuis, n. sp.* P. cellulis diametro (0008″–001″) plerumque equalibus, rarius duplo longioribus, obscuro-viridibus vel atro-purpureis, sterilibus. Hab. in lacubus, New Jersey.

I sent this plant out when first discovered as a Zygnema. Later collections prove it to be a distinct species as named.

Vaucheria, DC.—V. racemosa, Walz. Fine specimens. Coll. by Dr. Hobby, Iowa City.

Conferva, Link.—C. tenerrima, Ktz.—C. abbreviata, Rabenh.

Rhizoclonium, Ktz.—R. fluitans, Ktz. Frequent in streams in N. J. —R. flavicans, Jürg.—R. Casparyi, Harv.

Oedogonium, Link.—O. flavescens, Hass. Atsion, N. J.—O. decipiens, Wittr. and O. crassum, Wittr. Coll. by Dr. Hobby, Ktz., Iowa City.—O. cryptoporum, Wittr., frequent.–O. stagnale, Wittr., from Bound Brook, N. J.—O. fragile. Wittr. Coll. Dr. Beardslee, Ohio, and J. D. Smith, Florida.—O. polymorphum, Wittr. & Lund, Brown's Mills, N. J.—O. laeve, Wittr. Hopatcong, N. J.—O. plusioporum, Wittr., Waterloo, N. J.—O. ciliatum, Hass, Atsion, N. J.

O. Donnelli, n. sp.—O. oogoniis singulis, subglobosis; oosporis echinatis, oogonia fere complentibus, globosis, echinis conicis; androsporangiis 4–10–cellularibus; nannandribus bicellularibus, paullulum curvatis, stipitatis, in cellulis suffultoriis sedentibus. Crassit. cell. veget .0023″–.0025.″ Altit. 1–2–plo major. Oogon .003″-.0033″; oospor. c. echin. .0028″–.003.″ Coll. J. D. Smith, Florida, 1879.

Bulbochaete, Ag.—B. monile, Wittr. and Lund. Hopatcong Lake, N. J.

Hormiscia, Aresch.—H. speciosa, Crouan. Brackish water near N. Y. Coll. R. Hitchcock.

Ulothrix, Ktz.—K. tenerrima, Ktz.—Coll. Dr. Hobby, Iowa.—U. compacta, Ktz. Small pool, Perth Amboy, N. J.

Microthamnion, Naeg.—M. Kützingianum, Naeg. Water troughs, etc.

Stigeoclonium, Ktz.—S. irregulare, Ktz.

Coleochaete, Breb.—C. soluta, Pringsh. Ponds, N. Jersey. Collected fine specimens in various stages of development. The young forms reflect upon the character of *Chaetococcus*, and tell a tale on forms of *Aphanochaete*, and particularly on *Horposteiron* (*Aphanochaete*) *globosa*, Nordst.

Chantransia, Fries.—C. macrospora, Wood. Hitherto found only in S. C. The large pond at Atsion, N. J., abounds with it. Along the shores, it grows on sticks, larger timbers, and the roots of trees extending into the water:

Batrachospermum.—B. vagum, Roth., is also frequent in the same pond.

§ 36. **Note on the Differences between Cyperus ovularis,** Torr., **and C. cylindricus,** N. L. Britton, (with a plate.)

In the BULLETIN for August, 1879, I called attention to the fact that *Cyperus* (Mariscus) *cylindricus*, should be regarded as specifically distinct from *C. ovularis*, and not as merely a variety of the latter. I take this opportunity to figure the most marked differences between the two species on the accompanying plate. Fig. 1 is an umbel of *C. ovularis*, showing its dense globular heads; (B) is a three-flowered spikelet, and (A) an achenium of this species.

Fig. 2 represents an umbel of *C. cylindricus* with its cylindrical heads; (D) is a two-flowered spikelet, and (C) the achenium. Figures 1 and 2 are the natural size; (B) and (D) are enlarged six times, and (A) and (C) are enlarged twelve times.

The specimen of *Cyperus ovularis* from which the figures were drawn, was collected near Norfolk, Va., by Mr. H. P. Worcester; that of *C. cylindricus* I collected myself near Manchester, N. J.

I am indebted to Mr. Arthur Hollick for the beauty and accuracy of the drawings.

N. L. BRITTON.

SCHOOL OF MINES, N. Y., *April 19th*, 1880.

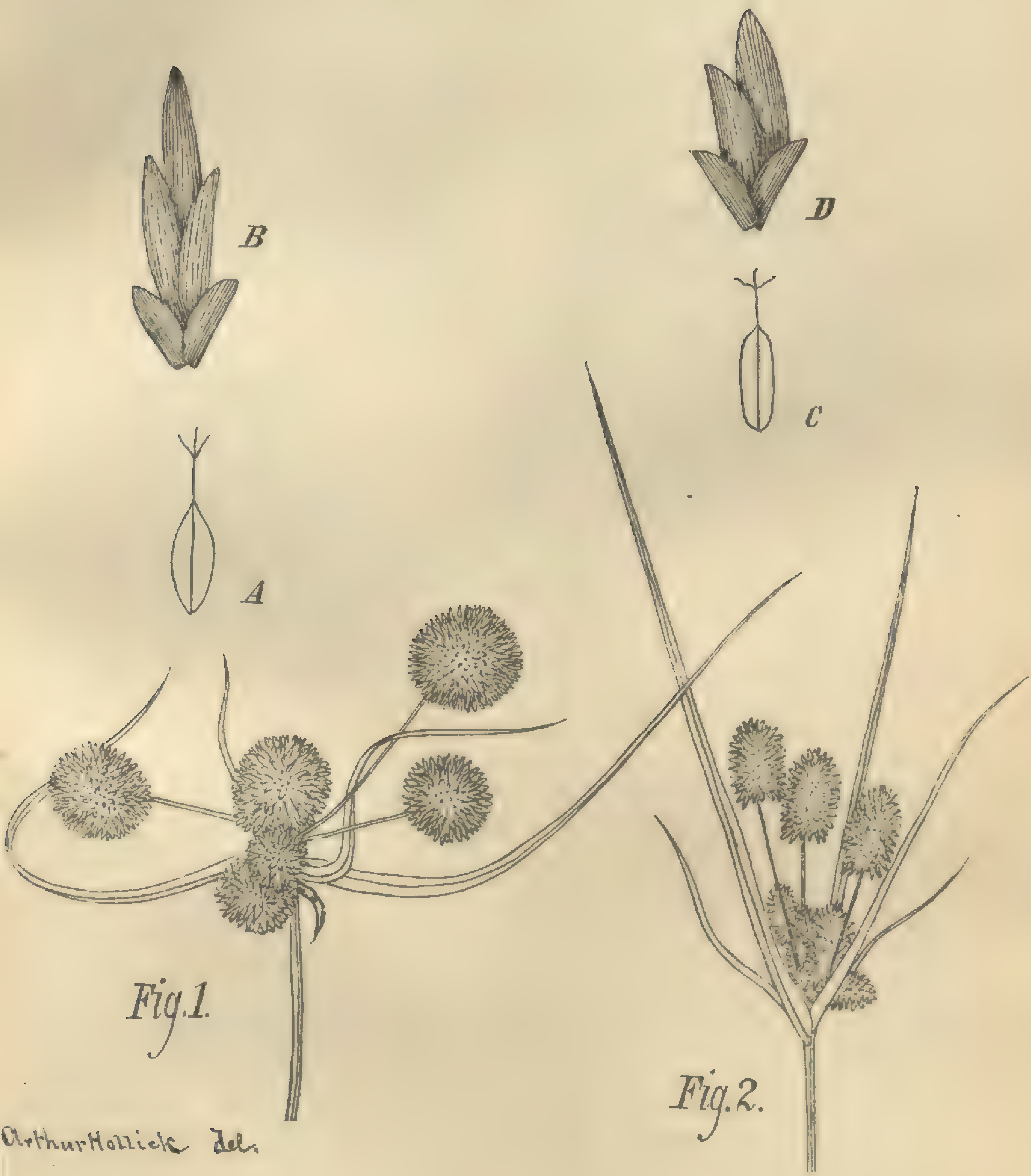
B
D
C
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Fig. 1.
Fig. 2.
Arthur Hollick del.

Fig. 1.—CYPERUS OVULARIS, Torr.

Fig. 2.—C. CYLINDRICUS, Britton.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VII.] New York, May, 1880. **[No. 5.**

§ 37. **Proceedings of the Torrey Club.**—The regular monthly meeting of the Club was held at the School of Mines, Columbia College, Tuesday eveing, May 11th, the President in the chair, There were present 28 members and 9 visitors.

Mr. S. Henshaw exhibited specimens of *Nepenthes Hookeri*, *Anthurium Scherzerianum*, and a large number of tropical orchids and ferns.

Mr. Le Roy exhibited a photograph of Thomas Nuttall; after which the President remarked briefly on the life and scientific labors of this naturalist.

The Herbarium Committee, through its chairman, Mr. Britton, reported that 210 specimens of plants had been received from Mr. Jos. Schrenck, and 75 specimens from Mr. F. Tweedy.

Mr. N. L. Britton was appointed a committee on "Field Days," with power to choose such assistants as he might desire.

Prof. Edward C. H. Day, of New York, was elected an active member.

According to previous announcement, Dr. J. S. Newberry delivered an interesting address on the "Ancient History of the North American Flora", and illustrated his remarks with a large number of fossil plants, which exhibited the successive changes undergone by our flora from the remotest up to the most recent geological times. Brief remarks on the subject of the paper were made by Messrs. Day and Leggett. On motion, the thanks of the Club were tendered Dr. Newberry for his interesting lecture, an abstract of which will appear in our next number.

§ 38. **The North Jersey Botanical Club.**—The first Field Meeting of the season was held at Little Falls, Passaic Co., N. J., on Saturday, May 8th. About forty members were present.

Lunch was taken at the Falls, after which a short business meeting was held, President Rusby in the chair. Arrangements were made for field meetings during the next month.

Among the "finds" were Ranunculus repens, L.; Viola rostrata, Pursh.; Arabis lyrata, L.; Silene Pennsylvanica, Michx.; Phlox subulata, L.; Houstonia caerulea, L.; Erigeron bellidifolium, Muhl.; Viburnum Lentago, L.; Staphylea trifolia, L.; Aralia trifolia, Gray; Hydrophyllum Virginicum, L.; Polygonatum biflorum, Ell.; Vaccinium corymbosum, L.; Geranium maculatum, L.; Uvularia perfoliata, L.; U. sessilifolia, L.; Obolaria Virginica, L.; Orchis spectabilis, L.; and Cypripedium pubescens, Willd.

While few of these plants are rare, yet all show that vegetation this year is from ten to twenty days in advance of its average at this season, and in this locality.

One of the members was fortunate enough to discover a last year's scape of Aplectrum hyemale, Nutt., and undoubtedly the flowers can be obtained before long.

The next monthly meeting will be held at Millburn, Essex Co., on Saturday, June 12th.

WALTER M. WOLFE, *Secretary*.

Montclair, N. J., *May 12th*, 1880.

§ 39. **A New Fern.**—With some ferns collected in the Chiricahui and Oro Blanco mountains of South-eastern Arizona by Wm. M. Courtis, and placed in my hands by Prof. Gray, I find a new species of *Notholaena*, which I name in honor of one to whom I am indebted for many courtesies, and take advantage of the opportunity thus afforded to show my appreciation of them in this manner.

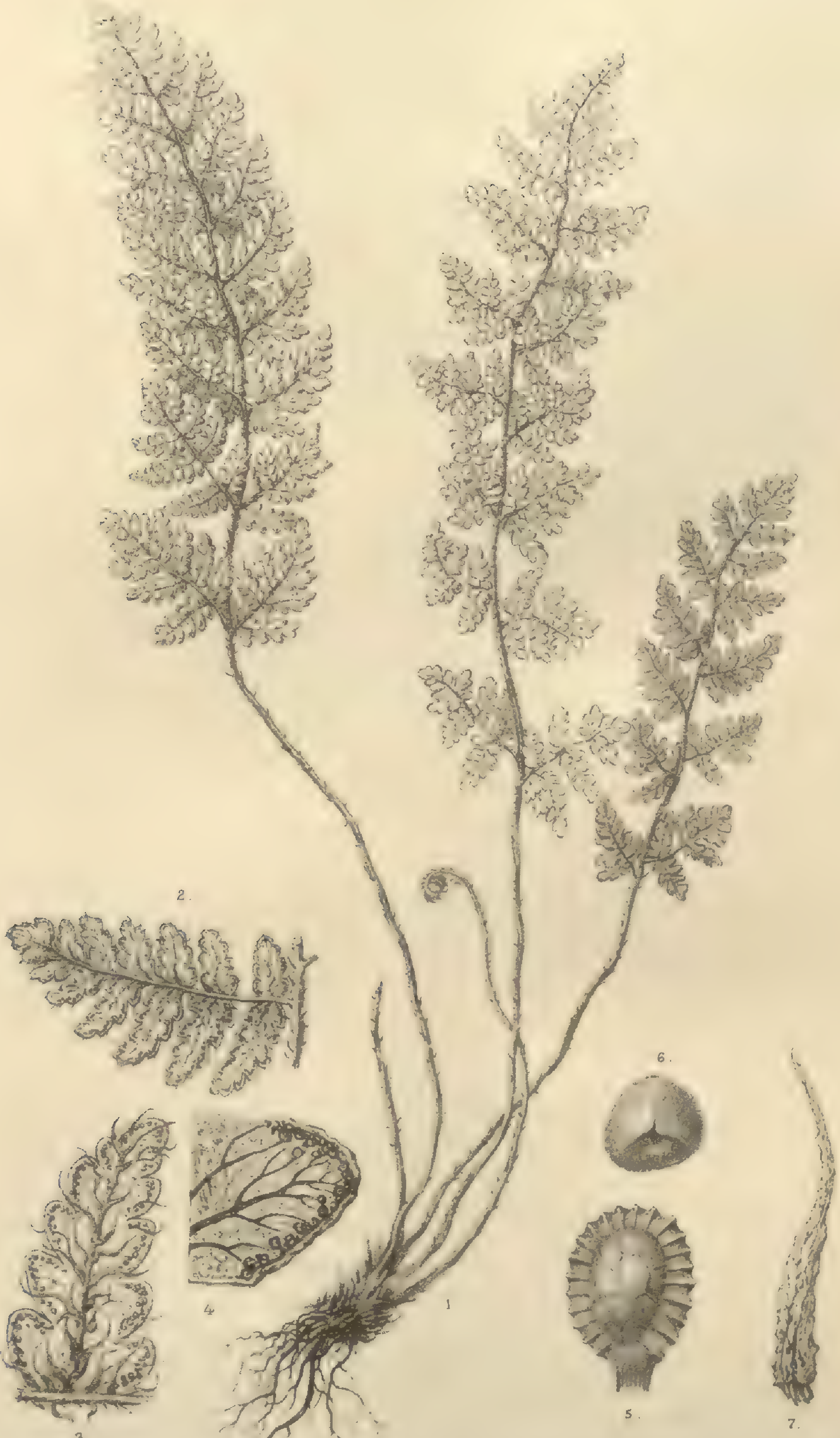
The other ferns collected by Mr. Courtis are *Gymnogramme hispida*, Mett., *Notholaena sinuata*, Klf., *Cheilanthes Wrightii*, Hooker, *Cheilanthes Lindheimeri*, Hooker, and *Pellaea Wrightiana*, Hooker.

Notholaena Grayi, *n. sp.*—Stipes tufted ?, 1¼–3½′ long, terete, chestnut-brown, with nearly black, rigid, linear-acuminated scales below, paler, deciduous scales above; fronds 2′–4′ in length, ¾′–1¼′ broad, oblong-lanceolate, once, or twice pinnate, upper surface sparingly, under thickly covered with white powder; rachises brown like the stipes, coated with a granular substance, extending down the stipes, and clothed with long, slender, entire or ciliated pale or whitish scales; pinnae short-talked, oblique, unequally triangular-ovate, ovate-lanceolate or lanceolate in different specimens (lowest pair nearly deltoid and distant, uppermost lanceolate), deeply pinnatified, or pinnately divided into 1 or 2 pairs of short-stalked or sessile, oblong, pinnatifid, obtuse pinnules, the remaining portion obliquely pinnatifid with alternate, lobed or entire segments; margins unchanged, reflexed. Sori brown, in a continuous line at the ends of the free veins.

Hab. Mountains of South-eastern Arizona, growing in clumps on the grassy slopes of the foot-hills. Wm. M. Courtis. February or March, 1880.

A lovely fern, so different from any known species, that, notwithstanding the small amount of material at hand, there can scarcely be a doubt as to its distinct character. In structure it is not unlike *N. distans*, R. Br., but in that species the fronds are hairy, longer, and wholly destitute of powder. Its nearest affinity is with *N. affinis*, Hook., but it is separated from that species by its more compound fronds, and distinct scaly rachises. There is no other species with which it can be compared. Under the microscope, the white powder separates into distinctly stalked gland-like bodies with enlarged conical, flat or inverted heads like a miniature host of fungi with their variously shaped caps. With a power of 200 diameters, or even less, the scales of the frond appear to be composed of elongated, cylindrical, tapering tubes containing a light brown coloring matter, collected into a mass at the base, or in spots at intervals throughout the length of the otherwise whitish scales, which are thus made to appear jointed.

The species is one of the most elegant yet discovered, and I take



C. E. Faxon, del

A. Meisel Lith

NOTHOLÆNA GRAYI.

pleasure in dedicating it to one pre-eminent in American Botanical Science.

Through the kindness of Mr. Faxon I am enabled to accompany my description of the new fern with an admirable drawing, of which I append the following explanation:

Figure 1, plant natural size; Figure 2, pinnæ enlarged; Figure 3, pinnule more enlarged; Figure 4, segment of pinnule showing venation; Figure 5, sporangium x 90 diam.; Figure 6, spore x 250 diameters; 7. scale from rachis of pinna x 25 diameters.

GEO. E. DAVENPORT,

Medford, Mass., *April* 20, 1880.

§ 40. Some of the rarer Plants of our Northern suburbs.

By EUGENE P. BICKNELL.

In the following paper, designed to illustrate some features of the flora of our northern suburbs, I have confined myself to a formal enumeration of species the occurrence of which seems to be of more or less interest. The principal field of my observations has been a limited one, confined to a section of country about half a mile wide, extending inland about two miles from the station of the N. Y. C. & H. R. R., at Riverdale. This region is all embraced within the limits of the 24th Ward of this city, and the water-shed of the Hudson, and where not otherwise specified, the observations apply to it. Occasionally they have been carried on in my neighboring districts, the extreme points of which may be represented by Ft. Washington and Fordham, on the S. W. & S. E., and a little beyond the limit of this city on the north.

The general order of the list follows that of Gray's "Manual."

Anemone Pennsylvanica, L. A bed of this plant grows at the foot of a lightly wooded slope to the Hudson River just above Spuyten-Duyvil. Here I found them in full flower, June 5th last. Also at Sing Sing, some miles from the river.

Thalictrum purpurascens, L., *var.* **ceriferum,** Aust. Sparingly, in woods just beyond the city limits, about 2 miles from the river. Just in flower, June 8, 1879.

Nuphar luteum, Smith, var. **pumilum,** Gray. Grows in inlets of the Bronx River, along Harlem R. R., above Williams Bridge.

Fumaria officinalis, L. A single plant near the track of the Hudson River R. R.

Dentaria diphylla, L. Growing commonly along the bed of a brook flowing into the Hudson, between Spuyten-Duyvil and Riverdale. In recent flower, May 10, 1879.

D. laciniata, Muhl. Grows abundantly within an area several yards in extent, in a glen close to the river. In full flower, May 8, 1879.

Barbarea praecox, R. Br. Growing along a fence, on a grassy slope about ¾ mile from river. Pods an inch long, April 19, 1878.

Sisymbrium Thaliana, Gaud. Common at several places. Plants with small pods, May 4th, 1879.

Hesperus matronalis, L. Along the roadside at Nasholon; also in woods along river below Manhattanville. Just in flower, May 23, 1879.

Viola odorata, L. has been rapidly increasing for years over a lawn and along a terrace, where the grass in some places has been entirely crowded out. Last year I found it among rocks in woods a quarter of a mile distant. The fragrance is still retained, and it blooms much earlier than any of our indigenous species, being in flower this season by the middle of March.

Hypericum prolificum, L. I found this shrub in full flower last August, growing among briers, and other shrubbery on the border of a small swamp, near the roadside opposite Jerome Park There were apparently several plants, which, if not indigenous, must have been growing there for some time.

Lychnis vespertina, Sibth. Common along Broadway, at Kings Bridge. May 16, 1879, just in flower.

Malva moschata, L. A single plant found growing by the roadside near Woodlawn.

Linum striatum, Walt. Not uncommon in swampy places.

Floerkea proserpinacoides, Wild. A small patch grows in the same glen with *Dentaria laciniata*, and close to the latter plant. Just in flower, May 8, 1879.

Euonymus Americanus, L. Not uncommon. Found at a number of places; both varieties occur. In fresh flower, June 8, 1879.

Staphylea trifolia, L. Rare; in swamp about 1½ mile from river.

Desmodium acuminatum, DC. Common; flowers about July 4th.

Robinia viscosa, Vent. I found a single tree of this species, near an old barn, by a wall in an upland pasture. June 1, 1879, it was in full flower.

Agrimonia parviflora, Ait. Uncommon; Have found it only in one spot.

Geum strictum, Ait. Sparingly in swamp along Broadway; also at Sing Sing.

Rubus odoratus, L. Not uncommon along river. Just in full blossom, June 4, 1879.

R. strigosus, Mchx. Found sparingly at several places where it had probably escaped, though unquestionably indigenous in woods below Inwood, and perhaps at one other locality near Riverdale.

Philadelphus (coronarius ?). Seems to be fully established about the borders of a small swamp, across the road from Jerome Park. Here, on June 25th last, I met with a number of shrubs in full blossom growing among clumps of shrubbery in different parts of the swamp, some of which were only accessible by wading.

Lythrum Salicaria, L. Several plants found in border of thicket in field, east of the R. R., between Fordham and Williams Bridge. In full flower, July 22, 1878.

Zizia integerrima, DC. Grows sparingly on wooded slope to the river just beyond Riverdale. Pods almost mature, June 17, 1879.

Aralia spinosa, L. Several of these plants, growing with *Symphoricarpus*, among cluster of trees in deserted orchard; also at one spot on retired road east of Van Courtland Lake.

Lonicera sempervirens, Ait. Climbing high on a single tree, in a cedar copse, in wood about ¾ mile from river. In brilliant flower, June 9, 1879.

L. parviflora, Lam. Rare; one or two stations along the river.

Symphoricarpus vulgaris, Mchx. A small clump has grown for years by a fence along Broadway, above Kings Bridge; also occurs in larger quantities with *Aralia spinosa* in a deserted orchard.

Dipsacus sylvestris, Mill. Abundant along roadside near Williams Bridge. Also at several other places along roads within a mile of the Harlem R. R.

Diplopappus amygdalinus, T. & G. What is unquestionably this species (or variety) grows sparingly not far from Courtlandt Lake.

Solidago squarrosa, Muhl. Sparingly on wooded slope along Hudson, both at Spuyten Duyvil and Riverdale. Also opposite Yonkers on Palisades. Flowering the second week of September.

S. speciosa, Nutt. Typical form on Palisades opposite Yonkers, *var.* **angustata** occurs at the city limits, nearly a mile east of Broadway. In full bloom, Sept. 27, 1879.

Helianthus decapetalus, L. Grows commonly at several localities. The earliest in flower of its genus. July 22, 2879. Just blooming.

H. divaricatus, L. At several places along the river. Aug. 1, 1879, in full flower.

Lampsana communis, L. Occurs sparingly at the border of a small wood near an old residence where it has persisted for years.

Sonchus asper, Vill. Along a branch of the Spuyten Duyvil Creek near Broadway, not far from Kings Bridge.

Gaylussacia frondosa, T. & G. The only station I have discovered for this plant is in woods, at the summit of a steep slope from river, between Ft. Washington and Inwood.

Pycnanthemum incanum, Mchx. Dry hill, about half a mile from river; not uncommon; also below Inwood, in open woods. **P. muticum,** Pers. Sparingly in open woods, about one mile from river. **P. linifolium,** Pursh. A few plants in open woods between Ft. Washington and Inwood. **P. clinopodioides,** T. & G. Common at one spot near the above.

Lophanthus scrophulariaefolius, Benth. Not uncommon at two localities near Broadway.

Scutellaria pilosa, Mchx. The borders of a thicket just N. W. of Jerome Park is the only spot where I have ever found the plant. Here a scattered group yearly flowers about the last of June.

Origanum vulgare, L. Common along several roads about midway between Hudson and Harlem R. R's, and extending from the direction of the latter.

Thymus serpyllum, L. A small patch discovered on uninhabited wild slope surrounded by woods, perhaps a mile N. of Williams Bridge. Just in flower, Aug. 23, 1879.

Echium vulgare, L. A few plants found along Hudson River R.R.; also a patch by the roadside, between Riverdale and Williams Bridge. In 1877, I found this plant abundant along the Ulster and Delaware R. R. in the Catskills.

Ipomoea pandurata, Meyer. Several fine plants just in flower, Aug 28, 1879, near summit of hill just above Spuyten-Duyvil.

Polygonum Careyi, Olney. Sparingly in ditch along track of Hudson R. R. R., below Kings Bridge. Sept. 7, 1879, just in flower.

P. amphibium, L. With the above, and in flower a little in advance of it.

Betula nigra, L. A tree of four trunks, about 20 feet high, grows in low wood near the city limits, about ½ mile east of Broadway.

B. lutea, Mchx. L. Several trees along a rocky stream between Williams Bridge and Woodlawn.

Zannichellia palustris, L. Marsh near Broadway, above Kings Bridge; also between this station and Morris' Dock.

Spiranthes graminea, Lind. *var.* **Walteri**, Gray. A single plant found in 1878, ¾ mile N. of Kings Bridge. Not since discovered.

S. simplex, [?] Gray, Several plants found on dry grassy ground in Woodlawn Cemetery. Had been in flower some time, Aug. 30, '79.

Calopogon pulchellus, R. Br. Rare; a single plant only.

Liparis liliifolia, Rich. Have found this plant at several localities, both close to the river, and two miles inland, sometimes growing quite abundantly. In flower, May 26, 1879.

Aplectrum hyemale, Nutt. Sparingly in Oliff Park, less than a mile N. W. of Jerome Park. May 1, 1879, full flower.

Cypripedium parviflorum, Salisb. June 1, 1879, a single plant in full flower near the City limits.

Smilax glauca, Walt. Not uncommon.

Polygonatum giganteum, Dietrich. At several localities.

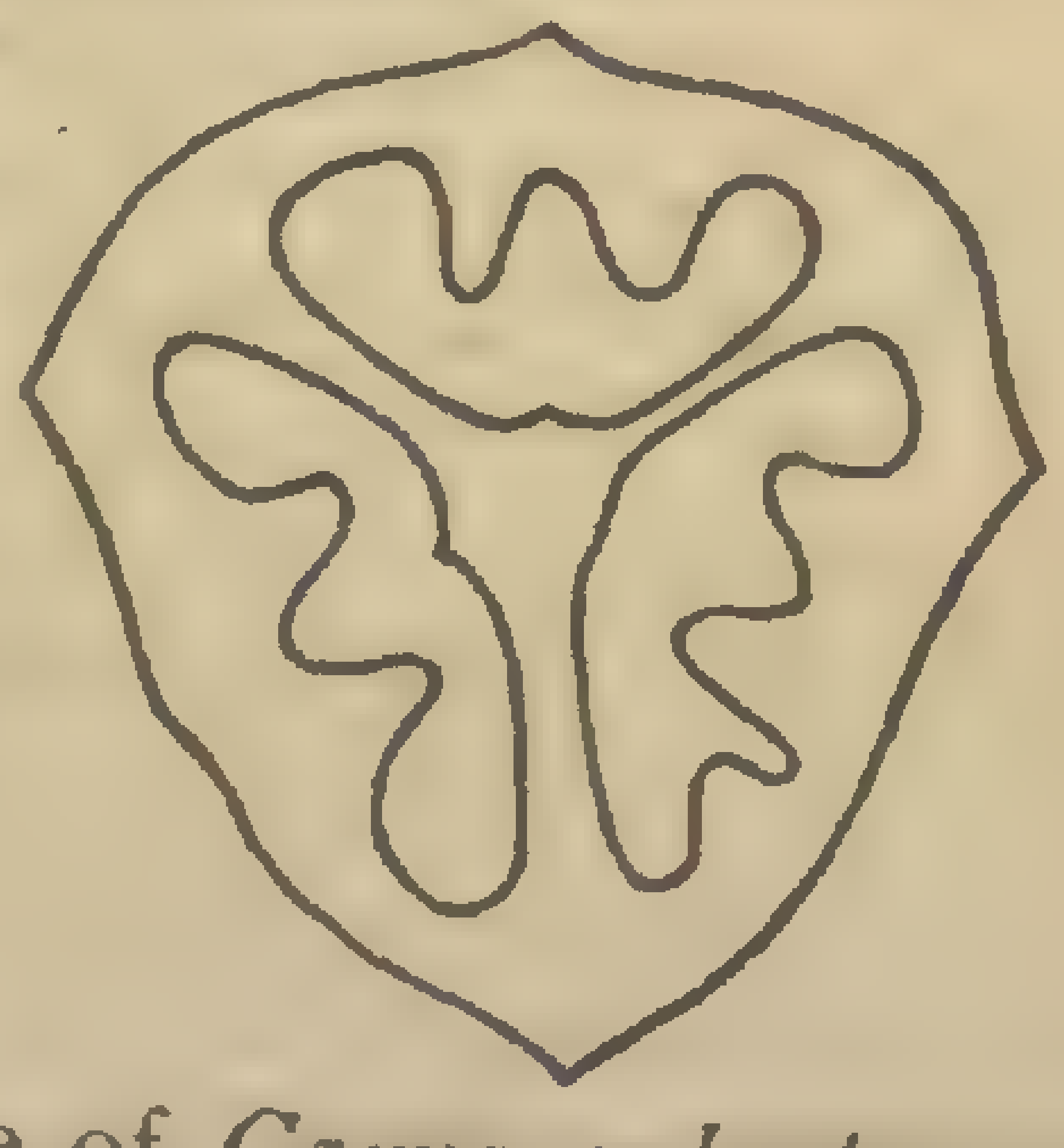
Allium tricoccum, Ait. Found only in a glen by the river where it it is not uncommon. A luxuriantly growing bed of these plants in full flower, July 22, 1879.

§ 41. Teratology.

The study of abnormal growth, besides affording excellent practice in the principles of morphology, is capable also of rendering very important assistance in tracing the derivation of forms, and perhaps in determining whether an existing form is an advance or retrogression. In the new edition of Gray's Text Book a sufficient sketch of the subject is given with reference to the special writers on the subject, but all its bearings have by no means been exhausted, and we are reminded by the following notes to call the attention of students to the close investigation of such cases, remarking that they are not the less interesting because they may have been observed before; in fact, that the frequent repetition of the phenomenon gives a better opportunity for exploring it.

Carya alba, Nutt.—The triangular or triquetrous nuts of *Carya alba*, Nutt., noticed in the February BULLETIN by Mr. Britton, are very common here, some trees [Carya alba ?] yielding quite a percentage of the abnormal form. Possibly this form of nut may be more common here than at the East. H. C. B.

Painesville, Ohio.



(The nuts sent us, a cross-section of one of which we represent herewith, appear to be those of *Carya sulcata*.—EDS.)

Salix.—In a swamp willow found on the 4th of April, 1880, many of the catkins bore both fertile and infertile flowers. The catkins towards the top of the shrub—which was about 7 ft. high—as well as those along the ends of the lower branches, were normally staminate, those about the bases of the lower branches producing pistillate flowers. These appeared first at the base of the staminate catkin, varying from a few in this condition, to a fertile catkin bearing a few staminate flowers at its apex. Most of the ovaries were variously bent and distorted, and, being borne on what were originally the filament of stamens, were disproportionately long-pedicelled. Each bract of the catkin produced two of these long-pedicelled ovaries, instead of one as normally. The pedicels were sparingly villous either at their base or throughout their entire length.

Between the perfect stamen and the developed ovary, every degree of transition was to be observed, the general course of the transformation seeming to be as follows:

The ordinary two-lobed stamen assumed an abruptly acute or mucronate apex, lengthening into a style, the end of which first becoming granulated, developed a capitate stigma. Some anthers remained almost unchanged otherwise, while this was taking place, the result being an anther provided with a style and stigma. During, or succeeding this change, the green connective of the dorsal surface of the anther begins to widen, separating and encroaching on the yellow lobes of the anther, and pushing them around to the ventral surface, which thus becomes concave. The style also bends over in this direction. The outer or convex side is now entirely green in color, the inner or concave face bearing the two-lobed divisions of the yellow anther. The outermost of these lobes on each side become gradually obliterated, assuming the green color till the yellow of the former anther persists only as two narrow lines separated by a shallowing fissure in the floor of the convexity. This also soon relinquishes its color and adopts the green. The convex sides now grow around and together from the style downward, until finally we have the complete shell of a pistil, silky hairy on its external surface, and developed as from an ovate leaf. Within the base of this incipient ovary, through the ventral suture, I noticed in several cases that a small gland had appeared, similar to the glands at the base of the flowers. I was unable to determine what this represented. No ovaries were found further developed than this point. The shrub was left for a week until some of the catkins should become mature, but on my next visit the monoecious catkins had all fallen away, the staminate ones alone remaining, and I was only able to secure two or three imperfect specimens on which the above remarks are based.

During the course of these transformations some curious abnormalities occurred; for instance, several of the developing ovaries were noticed spirally twisted upon themselves, and one had bent into a right angle, two narrow approximate lobes of the anther still persisting, extending like a brace across the angle of the geniculated ovary, and in this novel position were discharging pollen. Perhaps I should have stated that the willow (*Salix discolor?*) was growing on the border of a reedy marsh at the foot of a sandy railroad embankment, the filling in of which had somewhat altered the natural soil, perhaps causing the peculiar freak above described.

EUGENE P. BICKNELL.

Riverdale, N. Y. City, *April* 11, 1880.

Salix and Rubus.—I have just sent you, by mail, some specimens showing a curious case of metamorphosis in *Salix* (*S. cordata*, Muhl?). They were collected near Plainfield, during May, 1879. The change of stamens into pistils is not, I believe, very rare in this genus, but here we have pistils passing into stamens through various gradations. There seems in these specimens to be a tendency in the ovary to separate into as many parts as there are stigmas, namely, four, forming as many imperfect ovaries; or one or more of the parts changing into stamens more or less perfect. The stalk of the ovary will thus often bear four branches, some of these being stamens and others ovaries. The anthers are sometimes attached to the side of an imperfect ovary.

I have also sent you a specimen of *Rubus Canadensis?* L., collected in a sandy field at Plainfield, during May, 1879. The flower has a strong tendency to revert to a leafy branch. The sepals are perfect leaves, are cut-serrate and even-lobed, and the stamens have changed into petals more or less perfect. All the plants growing near this one were found to have the same habit.

FRANK TWEEDY.

Maple with triple samara.—One of the sugar-maples in Broadway, Saratoga, has three keys to the fruit, in a large proportion of the latter. These keys are regularly disposed at an angle of 120°, and are in all respects normal, save as to number. All those collected by me had two or three seed-vessels excavated by a squirrel, and it turned out that the uninjured key was empty. The ordinary 2-keyed fruit of this species usually has one of the seeds abortive, and the squirrel is aware of this fact, though some of the books seem to have forgotten it.

The triple fruit of this tree is instructive as pointing to *Staphylea* (the bladder-nut), the horse-chestnut, and other allied genera which have fruit mostly with three divisions (or 2 or 1 by suppression). A 3-celled ovary is characteristic of Sapindaceae, to which these plants are now referred, and thus the triple samara of the maple may be regarded as not a case of pure monstrosity, as much as a reversion to the ordinal type. If it be true, as I was informed, that another tree near Saratoga presents the same peculiarity, the case is all the more striking, as showing a tendency towards reversion.

G. M.

Samaras of Maple.—*Acer dasycarpum*, Ehr., has nearly always one of its seeds and keys abortive. From one to six of the fruits in each raceme of *Acer Pseudo-Platanus* will usually be found to consist of three (very rarely four) samaras. The fruits at the base of the raceme, as well as the terminal one are those that generally exhibit this peculiarity.

W. R. G.

§ 42. **Note on Populus balsamifera,** L. var. **candicans,** Gray— At the roadside, about two miles north of the city of Newburgh, on the Hudson, there is a remarkable specimen of the "Balm of Gilead" tree, which from its size, and probably great age, is deserving of being put on record in a botanical journal, and the more so, from the fact that the aged giant has been giving evidence for the last few years that its days are nearly numbered. In regard to this interesting tree (from whence a small collection of houses in the vicinity has received the name of Balmville) Mr. Ruttenber, in his History of the Town of Newburgh, gives the following facts: "Mr. Gilbert Williams, now (1875) in his 80th year, and who became a resident in its vicinity in 1808, relates that when in Nova Scotia (where he resided for nine years prior to 1832) he became acquainted with a John Cosman, who was an apprentice to Wm. Bloomer before the Revolution, who stated that while he was an apprentice he had shod horses under it many a time, and that it was a large tree then. Mr. Williams measured the tree in 1832, and its circumference (two feet from the ground) was 15 feet 2 inches. He measured it again in 1868, and found it to be 19 feet 5 inches, showing its growth to have been 4 feet and 3 inches in thirty-six years. His own recollection of the tree, added to Cosman's, carries it back at least a hundred years." There are, as might be expected of so notable an object, several traditions as to the origin of this tree. One is that the slip from which it grew was brought from New Jersey by a family of early settlers. Mr. Isaac Demott, an aged gentleman, son of one of the first settlers of the locality, and who would be likely to know more about it than any one else, told Mr. Eager, the historian of Orange County, in 1846, that "the tree grew there naturally—that when it had grown large enough for a rail, he cut it down to use it for that purpose—that it sprouted from the root, and he let it grow."

The "Balm of Gilead" is said by Muhlenberg to grow in New York, but Dr. Torrey, in the Flora of the State, says: "I have not found it indigenous within our limits." W. R. G.

The typical form of *P. balsamifera* occurs on the right shore of the Sacondaga River at Hope Centre, Hamilton Co., N. Y. I saw no large trees there, but there are quite a number of small size in the vicinity of a cabin which has been long unoccupied. They seemed to me to have sprung up spontaneously, perhaps suckers from larger trees that had been cut down to make the clearing. W. H. L.

§ 43. **Botanical News.**—In Trimen's *Journal of Botany* for March, Mr. J. G. Baker begins a Synopsis which is designed to embrace descriptions of all the known species of *Isoetes*. In the continuation of his paper "On the Botany of the British Polar Expedition of 1875–6," Mr. Henry C. Hart notes the fact that some plants seem unable to flower in Discovery Bay. Thus *Epilobium latifolium* and *Polygonum viviparum* do not nearly arrive at perfection; *Arenaria Groenlandica*, *Arnica montana*, *Saxifraga rivularis*, and *Cardamine pratensis* make no effort to flower, while others, such as *Saxifraga cernua*, *S. nivalis*, *S. tricuspidata*, and *Festuca brevifolia* blossom only very sparingly. Again, the anthers of others, such as *Alopecurus alpinus*, and *Stellaria longipes* rarely open so as to shed their pollen, as they do abundantly in lower latitudes. These instances go to confirm the author's observation that Arctic plants are independent of reproduction by seed. Butterflies and other insects, whose office it is to fertilize flowers, occur here ; but this duty is no longer performed by them, and they remain merely as the relic of a former more extensive Arctic fauna. The other papers in this number are "Notes on the Flora of Northamptonshire," by G. C. Druce, and "On the Distribution of Hypnum salebrosum in Britain," by E. M. Holmes.

Catalogue of the Pacific Coast Fungi, by H. W. Harkness, M. D., and J. P. Moore, A.M. This Catalogue, issued under the auspices of the California Academy of Science, is the first of the kind ever published on the Western Coast, and contains the names and stations of such fungi as have been thus far found and identified by the authors in a district embraced within quite extended limits—from Mt. Shasta on the North to Fort Yuma on the South, and from the seashore to the eastern limits of the Sierras. The authors say that "in the cave fungi, or fungi of our mines, comparatively little has been done. Want of literature on this subject has been a great hindrance to us in this work. The single cave fungus placed in the addenda is so striking that we have deemed it worthy of an insertion." The remarkable fungus here referred to, described by Mr. Moore under the name of *Agaricus tridens*, was found in a Nevada mine at a depth of 400 feet below the surface. The stem was 3 ft. and 4 inches long, and hung suspended from a piece of timber, to which it was attached by a disk several inches in diameter. At 9 inches from the point of attachment the stem divided into three branches, which again united at just 9 inches from the point of division, and immediately sent off two lateral branches. The main stem continued downward, enlarging to the diameter of nearly 3 inches. At the point of attachment of the cap or pileus short branches, resembling the young antlers of a stag, projected. Two of them, more vigorous than the rest, extended downward, the larger of the two dividing into three branches, thus terminating the whole in a perfect trident. This is one of those curious monstrosities of some fungus which are very apt to occur in such situations as the one described, and which have often been noticed in Europe. Certain conditions of heat and moisture, combined with the absence of light, seem to conspire to cause an exuberance of growth of the hymenophore and its support at the expense of the hymenium and its fruit. Were the specimen under consideration a normal one, its decurrent, notched gills, its coriaceous texture, and its woody habitat would undoubtedly place it, not in the genus *Agaricus*, but in *Lentinus*. The majority of the fungi embraced in the list belong to the same genera and species as those found in other portions of the United States ; although, as might have been expected, a large number of new species have been detected. The most remarkable discoveries, it seems to us, are those found recorded in the order Trichogastres, where we notice the names of *Podaxon Loandensis*, *Lycoperdon asperrimum*, *L. bicolor*, *L. caespitosum*, and *L. radicatum*, all of which were originally described by Wellwitsch and Currey (Linn. Trans. xxvi) from the southwest coast of Africa. As a whole, the catalogue before us represents the results of a vast deal of labor on the part of the authors. We trust that they will continue the work they have begun until they have made known to us the entire mycological flora of the western coast of the United States.

Prof. Lawson Tait, who has been making extensive researches on the structure of "Pitcher Plants," (including under this name *Sarracenia* and *Darlingtonia*) is writing an instructive series of articles on the subject for the *Midland Naturalist*, one of which occurs in the March number, just received.

Nature, March 11th, prints an abstract of a paper read by Dr. Siemens before the Royal Society, March 4th, on the influence produced by the electric light on vegetation. Dr. Siemen's experiments thus far are but preliminary to other and more precise ones that are soon to be undertaken, but their general result has shown that plants exposed to the sunlight only, or to the electric light only, thrive about equally; while those exposed to sunlight first, and then to the electric light after sunset, surpass in vigor and rapidity of growth those submitted to solar light alone. These experiments are not only instructive in proving the sufficiency of electric light alone to produce chlorophyll in the leaves of plants, and in promoting growth, but they also go to prove the important fact that nightly repose is not absolutely necessary for the life of plants. It may, however, be argued from analogy, that such repose is not necessary, seeing that annual crops grow and ripen, and plants develop rich colors and aromas in a wonderfully short space of time in the northern regions of Sweden, Norway, and Finland, where the summer does not exceed two months, during which period the sun scarcely sets.

Science Gossip for March contains an article by J. Saunders, "On Alternate Dehiscence of Anthers." In his work on "Insects and Flowers," Sir J. Lubbock states that the five "polliniferous anthers of *Parnassia*," ripen not simultaneously but successively, and as each ripens it places itself right on top of the stigma, with its back to it, and the pollen is then discharged from the anthers on the side away from the stigma, so that it is scarcely possible for any to fall on it, and this is done by the five stamens in succession." Mr. Saunders, after careful observations made on upwards of two hundred blossoms, arrives at the conclusion that a portion of this description is scarcely correct. His own account of the phenomenon is as follows: When the corolla expands, the stamens are recumbent on the ovary and closely applied to it, forming a compact whorl on the top of the stigma. First one of these anthers is slightly elevated, and as the dehisence continues it is carried forward, describing an arc in its course, till the filament lies extended between the petals. The empty anther is suspended over the edge of the sepal, to which the stamen is opposite, and soon falls off. These movements are repeated by the stamens invariably in an inverse order, which may be expressed thus $\begin{smallmatrix}3 & ^{1} & 2\\ 5 & & 4\end{smallmatrix}$, and never in such a succession as would be represented by $\begin{smallmatrix}2 & ^{1} & 5\\ 3 & & 4\end{smallmatrix}$. Subsequent observations showed that this alternate ripening of anthers occurs also in *Menyanthes trifoliata*. In many instances, in plants whose stamens are bicyclic, and thus double the number of petals, the dehiscence of the outer whorl, or those opposite the sepals, occurs first, and afterwards of the inner cycle or those opposite the petals. In these instances the alternation is between the cycles of the stamens, and agrees with the sequence of their development. Examples of this are furnished by several species of *Stellaria*, *Saxifraga*, *Epilobium*, *and Lilium*. The other botanical articles in this number are "The Rose of Jericho," (*Saulcya*, not *Anastatica*,) by T. E. Amyot, "List of Local Floras of Britain," by B. Hobson, and "Plant Rambles in Wales," by G. C. Druce.

Grevillea for March, contains articles by the Editor, Mr. M. C. Cooke, on the Fungi of the Libert Herbarium, "On the sub-genus Coniophora," on "The Fungi of India," and on "Some New York Fungi,"—the latter including descriptions of several new species belonging to our City's flora. The other articles are by F. Kitton on "The Diatomaceae of Kerguelen's Land;" by Phillips and Plowright on "New and Rare British Fungi;" by the Rev. J. M. Crombie on "New British Lichens;" and by Dr. Quelet on "Some New Fungi from the Jura and Vosges."

In the *Botanical Gazette* for March, Dr. Gray writes on "The Genus Leavenworthia," and calls attention to the "Automatic Movement of the Frond of Asplenium Trichomanes;" Dr. Rothrock tells "How to make Permanent Botanical Objects for the Microscope;" Mr. C. H. Peck describes a number of "New Species of Fungi;" and Mr. G. E. Davenport contributes a note on "Pteris aquilina." Last, but not least, the Editor speaks in complimentary terms of the BULLETIN, for which we thank him.

The *Quarterly Journal of Microscopical Science* prints an article on the Pollen-bodies of the Angiosperms by F. Elfving, translated and condensed from the "Jenaische Zeitschrift." A much shorter abstract of this paper was given by Dr. E. P. Wright in "Nature" last summer, and may be still further condensed as follows: It is asserted in the more recent manuals of botany that Gymnosperms and Angiosperms are differentiated, one from the other, by certain striking peculiarities relating to their reproductive systems; one of these being that in the former the pollen-grains are multicellular, and that in the latter they are unicellular. This distinction now turns out to be untrue. Fred. Elfving, of Helsingfors, working in the physiological loboratory of Strasburger at Jena, has proved that the pollen-cell of wind-fertilized or self-fertilized Angiosperms is also compound; or, in other words, that each pollen-grain becomes divided into two cells, one of which plays the part of a vegetative cell merely, and the other one takes upon itself the growth and functions of the pollen tube. Of these cells, the "vegetative" one is the smaller, and by a further division becomes developed into a two—or often a three—celled thallome. The vegetative cell, or cells, are only separated from the larger cell by a wall of cortical plasm, which, in particular instances, can become formed into a firmer membrane. Elfving does not seem to have studied the pollen of cleistogamous flowers, which, as suggested by Dr. Wright, might reveal some interesting facts.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VII.] New York, June, 1880. **[No. 6.**

§ 44. **Proceedings of the Torrey Club.**—The regular monthly meeting of the Club was held at the Herbarium, Columbia College, Tuesday evening, June 8th, the Vice-President in the chair. Twenty-five members and eight visitors were present.

Mr. Britton read a report in regard to the field meetings that had occurred up to date.

A communication, accompanied by specimens, from Capt. J. Donnell Smith, was read by Mr. Leggett. The specimens sent were those of a fern which had been determined by Prof. Eaton as *Aspidium conterminum* var. *strigosum* (new to the United States), and of *Wollfiella gladiata*, var. *Floridana*, described below.

Mr. LeRoy, in behalf of the donor, Miss Mary C. Reynolds, of St. Augustine, Fla., presented the Club with a specimen of *Acrostichum aureum*, L.

On motion, the Secretary was directed to tender the thanks of the Club to the donors of the specimens.

Mr. Jos. Schrenk called attention to a remarkable specimen of a sassafras tree which he had recently observed on Jackson Avenue, near Newton, Long Island, the trunk of which measured 8 ft. and 6 inches in circumference. Dr. Newberry remarked that in the West, where the tree was abundant, he had seen specimens that were 2 ft. in diameter, and that these were considered of extraordinary size, but he had never met with any so large as the one mentioned by Mr. Schrenk.

A letter from Mr. J. H. Gore asking information in regard to "Tuckahoe" was referred to Mr. Gerard to report upon.

Prof. Wood exhibited specimens and read a list of twenty-five Idaho plants received by him from Lieut. Wilcox, two of which he thought were new species. Among the specimens was a species of *Peucedanum*, which Dr. Newberry stated formed an important element of food for the Indians of Idaho and Oregon. From the root, which is the part used, the epidermis is stripped off, and the internal portion is pounded fine and made into bread or pressed into flat cakes.

Mr. Brown presented to the Club's Herbarium specimens of three grasses found in New York City and new to its flora—*Festuca Myurus*, L., *Glyceria procumbens*, and *Phleum arenarium*, L.

An invitation was read from the North Jersey Botanical Club to join its members in a botanical excursion to Millburn, N. J., on Saturday, June 12th.

On motion the invitation was accepted.

Mr. Wolfe, the Secretary of N. J. B. C., being present, made, on invitation, a few remarks on the character of the flora of the locality to be visited.

Mr. Jos. Schrenk read a note on the parasitism of *Aphyllon uniflorum*, T. & G. This communication gave rise to considerable discussion in regard to other parasitic plants, such as *Monotropa* and *Epiphegus*.

Mr. Brown stated that he had recently detected a foreign species of *Orobanche* on the ballast heaps at Hunter's Point, which was growing at some distance from any other plants and did not appear to be parasitic, but that the matter needed further and closer investigation than he had given it. After a lengthy discussion of *Monotropa uniflora*, L., which was taken part in by Dr. Newberry, and Messrs. Wright, Britton, Leggett and others, Mr. Braman promised to study the plant's mode of life during the present season, and report thereon.

Mr. Britton read a paper on the "Northward Extension of the New Jersey Pine Barrens Flora on Long and Staten Islands."

Two names were proposed for active membership.

On motion the Club adjourned to meet during the months of July and August on call of the Secretary, and at such places as he may select.

§ 45. New or Little-known Ferns of the United States. No. 8.

✓ 24. **Aspidium conterminum**, Willd., var. **strigosum.**—This is the name which seems proper to be borne by a fern discovered by Capt. J. Donnell Smith, last March, in a miry swamp which drains into Peace Creek, Polk Co., Florida. The fern is related to *A. Noveboracense* and more closely to *A. Nevadense*, and belongs to a group of forms referred to *A. conterminum* in *Synopsis Filicum*, but divided into several species by Fée, Fournier, and other writers. The form found in Florida agrees perfectly with an authentic specimen of *A. strigosum*, collected in Guadaloupe by L' Herminier, and described by Fée in his Histoire des Fougères et des Lycopodiacées des Antilles, p. 78. t. XXII, fig. 2. It is also identical with *A. exsudans*, var. *majus*, of Fournier (Pl. Mex., Crypt. p. 93), as shown by a comparison of authentic specimens. From the more strictly limited *A. conterminum* it differs by the shorter stalk, and the more rigid frond, the under surface of which is copiously dotted with resinous globules, and by the presence of minute mamillate glands on the sides of the rachis at the insertion of each pinna. The character written for the Appendix of the "Ferns of North America" reads thus: "Root-stock stout, erect, often rising above ground, bearing a crown of fronds; fronds 1 to 4 feet long, puberulent and glandular beneath, very short-stalked, lanceolate, caudate-acuminate, much narrowed at the base, somewhat rigid, pinnate; pinnae sessile, narrowly lanceolate from a broader base, acuminate, deeply pinnatifid into oblong obliquely sub-falcate obtuse segments; veins free, simple; sori near the margin; indusium reniform, minute, glandular and somewhat pilose, evanescent."

A peculiarity, pointed out to me by Capt. Smith, is that the base of the stipe, for a little distance, is narrowly wing-margined on both sides by a protrusion of the parenchyma through the outer sclerenchymatous sheath. This is seen best by cutting a thin cross-section of a stalk which has been soaked a long time in warm water. The rhizome is mostly erect, often standing nearly a foot out of ground, and with its circle of spreading fronds gives the plant the aspect of a miniature tree-fern.

25. **Notholaena nivea,** Desvaux.—Root-stock short, chaffy with narrow scales; stalks clustered, wiry, black and polished; fronds 3 to 6 inches long, pyramidal-ovate, tripinnate; primary pinnae mostly opposite, the rachises nearly straight; pinnules 2 to 3 times as long, ovate or oval, obtuse, entire or more or less lobed, smooth and green above, beneath densely white-pulveraceous, sporangia brown, often descending the free veins more than half-way to the midvein. ✓

Arizona, the particular station not given; Mr. J. G. Lemmon, collected very recently. This fern is so closely related to *N. Fendleri* and *N. dealbata*, that the three might almost be considered forms of one species. *N. nivea* has narrower fronds than *N. Fendleri*, its rachis is straight, the principal pinnae are opposite, and the frond is less compound, and has larger pinnules. *N. dealbata* is a smaller plant, the fronds more compound and the pinnules much smaller. *N. nivea* occurs commonly in Mexico, and its range extends southwards to Peru.

26. **Notholaena Lemmoni,** *sp. nov.*—Root-stock short, scaly with narrow pointed rigid dark-brown chaff; stalks dark reddish-brown, wiry, 4 to 6 inches long, chaffy at the base with scales a little wider and more scarious-margined than those of the root-stock, otherwise smooth; fronds 6 to 9 inches long, 1 to 1½ inches wide, linear-oblong, pinnate with numerous deltoid or ovate once or twice pinnatifid pinnae, the lowest ones a little shorter than the middle ones; upper surface herbaceous-green, smooth; lower surface covered with white or slightly yellowish ceraceous powder; sori forming a narrow sub-marginal line; margins of the segments very slightly recurved. ✓

Found in the clefts of granite rocks, on the southern side of the Santa Catarina Mountains, near Fort Lowell, and the town of Tucson, Arizona, by Mr. J. G. Lemmon (now residing at Oakland, California) in the Spring of 1880.

This fern evidently belongs to the same group of *Notholaena* (§ *Cincinnalis*) as *N. candida*, but differs from that species essentially in the long and narrow fronds, having also the lowest pair of pinnae smaller than the others near it, instead of being much the largest of any. From *N. Grayi*, its larger size, and the total absence of chaff from the frond will easily distinguish it. Mr. Lemmon is the discoverer of several of our rarer Californian ferns, and it is with real pleasure that I am able at last to name a fern of his own discovery in his honor. His Arizona collection, not yet distributed, contains many other rare ferns of interest, such as *Notholaena candida, Hookeri, dealbata, Parryi, sinuata* and *ferruginea, Cheilanthes myriophylla, Fendleri, Lindheimeri, Wrightii, Eatoni, Gymnogramme hispida, Pellaea Wrightiana*, etc., etc.

27. **Phegopteris calcarea,** Fée.—This European fern, though often attributed to North America, has only very recently proved its right to a place among our ferns. It was collected a few years ago by Miss Ellen W. Cathcart on slaty rocks, on the bank of the

St. Louis River in Eastern Minnesota. From our common *P. Dryopteris* it differs in having a glandular stalk and fronds, the latter more erect and rigid, and having smaller pinnae on the lower side of its primary divisions. An account of it will be found on page 277 of the "Additions and Corrections" of the "Ferns of North America"—*Aspidium conterminum* and *Notholaena Grayi* were received just in time to be mentioned in that work, but *N. nivea*, and *N. Lemmoni* have only come to hand when the last pages of the book are already printed. D. C. EATON.

New Haven, *June* 21, 1880.

§ 46. **Wolffia (Wolffiella) gladiata**, Hegelm, (*die Lemnaceen, eine monographische Untersuchung*, 1868, p. 133, Taf. III, fig. 24) var. **Floridana.**—Frons lineari-falcata, in apicem flagelliformem attenuata, 15–20-plo longior quam latior, margine subintegra, per omnes partes fere ad apicem cavernosa, totâ superficie cellulis pigmentosis ochraceo-punctata.

Hab. Gainesville, Fla., Nov., 1877, H. W. Ravenel; (specimens in Herb. Harvard University from Dr. Geo. Engelmann under the name of *W. gladiata*, Hegelm.)—Great Gulf Hammock, Levy Co., Fla., growing in extensive and thick mats on or near the surface of stagnant water with *Lemna minor*, L., March, 1878, C. F. Austin and J. D. S.—Exsiccated swampy ground, Sumter Co., Fla., adhering to *Riccia natans*, L., var. *terrestris*, March, 1879, J. D. S.—Borders, exposed by the subsiding water, of a pool near Ocala, Fla., with *Wolffia Columbiana*, Karsten, *Lemna polyrrhiza*, L., *L. minor*, L., and *Amblystegium riparium*, Br. & Sch,, April, 1879, J. D. S.—Very abundant over marshes of *Typha latifolia*, L., four miles east from Cedar Keys, Fla., March, 1880, J. D. S.

Matured fronds are 3″ to 4″ long, diminishing in breadth from 0.2″ near the base to 0.04″ at the apex. The base is arcuately truncate with the stipitate angle hastate. The stipe is articulated, sub-persistent, and 0.35″ long. The pouch (*fovea*, *Taschengrube*) is elongated, acuminate, 0.6″ long, and at its mouth 0.3″ broad. The apical portion only of the frond ($\frac{1}{8}$ – $\frac{1}{10}$ of its length) is destitute of air-cavities. Usually 2, and sometimes 3 to 6, vegetative generations cohere. It is readily distinguishable from any described Cis-Mexican form of *Wolffia* by its elongation, but better by the character of the sub-genus, viz: "**Wolffiella.** Frons pone marginem lateralem foveae basilaris proliferae frondi maternae affixa, directione horizontali symmetrica. Plantae tantum steriles notae." (Hegelm. Lemnaceae in Martius' Flora Brasiliensis, fasc. LXXVI, 1878).

In the plant from Mexico, described as *W. gladiata*, the air-cavities do not extend to the anterior $\frac{1}{4}$—$\frac{1}{5}$ part of the frond, or to the portion forming the pouch; the sabre-shaped frond is one-half shorter in proportion to its breadth, and with a 4 to 5 times broader rounded apex.

Dr. Hegelmaier writes as follows in regard to specimens of this plant submitted to him for examination under the name of *W. Floridana*, n. sp.:

"The plants from all four stations belong strictly to the same form, and that is nearly related with the one from Mexico, described as *W. gladiata.* As is correctly observed in your description, the Florida is distinguished from the Mexican plant by the much (1½–2 times) greater elongation of the fronds. The apical portion especially is considerably narrower in proportion ; and, although there is always a part of that portion destitute of air-cavities, yet that part is relatively shorter. Moreover, the sabre-like curvature of the fronds is often more decided. The last two characters are directly associated with the more elongated forms. I have some doubts, however, whether it is advisable to distinguish *W. Floridana* as a species. From my observations of other *Lemnaceae* I should hardly venture to found a separate species upon the above differences. At any rate, however, we have here a beautiful and interesting form, the discovery of which in such quantities in Florida constitutes an important contribution to the Flora of the United States. Had both forms come to my knowledge at the same time, I should probably have taken the Florida plant for the type of the species, inasmuch as it is constant with itself wherever you have found it ; and the Mexican plant would have been treated as a *var. abbreviata.* The Cedar Keys specimens are the best adapted for study of structure, as they abound in starch, and after colorization by chloride of zinc the extent to which air-cavities prevail becomes plain."

The sub-genus *Wolffiella* comprises three other species. These differ from *W. gladiata* only in subordinate characters. *W. denticulata*, Heglm., from South Africa, has air-cavities embracing the whole frond and the pouch, but pigment-cells are not present at the anterior end, and the apex of the linear frond is truncate and denticulate. In *W. oblonga*, Philippi, from Chili, and in *W. lingulata*, Hegelm., from Mexico, Brazil and India, pigment-cells pervade the whole plant, air-cavities embracing in the former species every part except the pouch, and in the latter species only a small part of the posterior end of the frond ; the outlines of each are as indicated by their names. I am indebted to Messrs. Sereno Watson and Charles F. Parker for the opportunity to examine typical specimens of *W. gladiata* and *W. lingulata.*

But Dr. Hegelmaier has remarked upon two singular deviations, which all of these plants exhibit from the type of *Wolffia*, and which have led him to conjecture that *Wolffiella* will constitute a distinct genus when its reproductive organs shall come to be known.

1st. The insertion of the stipe at the basal angle, and the position of the costa along the lateral margin of the pouch, cause the frond to be *transverse*, instead of *median* zygomorphous.

2d. The stipe and costa of the cohering young frond occupy the opposite side of the pouch to those organs in the parent frond. Hence, if we detach the two fronds from each other, and bring them into superposition without changing their exposed surfaces, they will be found to have stipe and costa similarly right and left, and their agreement to be absolute, and not relative as in a pair of opposite leaves. This anomaly has been found difficult to interpret morphologically in the absence of any knowledge of the inflorescence of these plants.

JOHN DONNELL SMITH.

Baltimore, *May 27th.*

§ 47. **Bees and Flowers.**—I find that the behaviour of bees is governed by circumstances. When flowers are abundant they visit those only which they prefer, at other times they examine any thing which comes in their way. I have seen honey bees attack the vineyard ; though, as a general thing, it would be safe to say they would not eat grapes.

At the time I am writing, May 18th, there is a dearth of garden flowers. Those of the early spring are gone, and the later ones are not well forward. But *Aquilegiae* in many species are in bloom. The humble-bee bores the ends of the nectaries, and sucks the honey stored there ; and the honey-bee follows and sucks from the same hole what may be left, or what may be afterwards generated from the honey gland. I have often watched closely to learn whether the honey-bee bored for honey. Its quick motions are unfavorable to correct observation. I thought once I had caught it boring lilac flowers, but I afterwards counted all the flowers that had been bored by the humble bee, and then watched the work of the honey bee on the cluster, and there were no more bored afterwards than before. The *Aquilegiae* with curved nectaries, such as *A. vulgaris* and *A. Olympica* are very favorable for observation, as the slit is made on the upper side of the curve, and the honey-bee can be easily seen following after the crumbs that have been left on the strong one's table. I have no doubt, however, it would bore for itself if it had the power, and it perhaps sometimes does. The humble-bee and the honey-bee are evidently not the insects for which the *Aquilegia* had this beautifully contrived nectar cup provided to induce cross-fertilization, and what particular insect was designed to be the favored one, so that it and no other could turn its tongue around these twisted spurs to get at the honey in the end, I think no student has discovered.

THOMAS MEEHAN.

§ 48. **Notes on the behavior of Fig trees after an unusually severe winter in Syria.**—The last winter was one of rare severity in Syria. Ice formed a quarter of an inch thick in Beirut. Snow fell to the depth of several inches. Such phenomena had not occurred for twenty years. As a result of this extraordinary cold, many fig trees in the mountains died and the growth of the fig orchards of the plain was seriously checked.

The fig tree usually puts forth its bud, which is an inverted torus lined with apetalous flowers, at the time of the first appearance of the young leaves. In fact, the fruit bud is a little in advance of the young leaves. It was this circumstance which caused the curse on the barren fig tree, which had leaves but no figs. A fig tree with leaves ought *a fortiori* to have figs. But this year the cold winds and frost checked and destroyed the fruit buds which ought to have appeared early in March. On a tree in my garden which usually produces hundreds there were about a dozen. The leaves, however, unfolded somewhat later than usual, and the scattered early figs which had escaped the frost developed with them. A month later than the complete growth of the leaves, and after the early figs had attained the size of a hickory nut, the branches were covered with a profusion of fruit buds, even more than usual, owing no doubt to the depth to which the soil had become saturated by the unusually heavy rains of winter. We have, therefore, the phenomena of two crops of figs on the same tree, an early and a later, developed at the same time. I may remark that this is not a habit of the fig, as it is of some of the berries in temperate climates, which develop a series of buds and mature a succession of fruits through a considerable period of time. GEORGE E. POST, M.D.

Beirut, *May* 26, 1880.

§ 49. **Aphyllon uniflorum,** T. & G.—My own observations during a number of years, and those of several members of the Club during the present season, seem to prove that, in our district, this parasitic plant grows on the roots of *Solidago*, only. It might not be out of place to request botanists of other sections to have an eye on the plant, in order to settle this question.

A close examination of the points of attachment shows that the suction-organs of *Aphyllon* (very small protuberances along the roots, or what corresponds to roots) consist entirely of parenchymatic tissue; its cells are large and roundish, only those cells that penetrate into the tissue of the foster plant are considerably elongated.

Comandra umbellata, Nutt., I found on blueberries; but as I ascertained this in a few instances only, I will not draw any conclusions. I just mention this plant to state that its suction organs differ widely from those of *Aphyllon*, by having well developed fibro-vascular bundles, the first ducts of which originate quite close to the tip of the organ. This difference, of course, will find its explanation in the different mode of assimilation that goes on in the two plants—the one being a true parasite, while the other has green foliage.

College Point, *June* 7, 1880. JOS. SCHRENK.

§ 50. **Sassafras officinale,** Nees.—I noticed an unusually large sassafras tree standing on a farm near Newton, L. I., its circumference about 1½ or 2 feet from the ground is 8 feet 6 inches. Two inches or so ought, perhaps, to be deducted, for several stems of *Ampelopsis* and *Rhus* climb up the trunk, which is well-formed and of nearly uniform thickness up to the lowest branches, at least 8 feet above the ground. The tree, in reference to height, presents the appearance of a large-sized stately oak; and, when covered all over with its shining yellow blossoms as it first caught my eye, is well worth seeing.

College Point, *June* 15. JOS. SCHRENK.

§ 51. **Teratological Notes.**—Prolification of the inflorescence in various species of *Plantago* seems to be of common occurrence in Europe and curious forms of it are occasionally noted in English periodicals. Dr. Masters, in his Vegetable Teratology, figures some of these and states that each species of this genus seems to have its own perverse mode of growth. Changes of this nature in our native and introduced species of plantains may be common, but accounts of them do not often find their way into print. A friend has specimens of *P. Rugelii* from Bloomfield, N. J., in which the upper part of the spike is branched and some of these branches have secondary branches. The same collector has from Carlstadt, N. J., *Typha latifolia*, in which there are several small spikes arising side by side from the top of the culm, and which appear to be due to fission. During the field meeting of the Club at New Dorp a few weeks ago a large number of specimens of *Plantago lanceolata*, L., were observed, in each of which there were from four to five long, thick sessile spikes terminating the scape. Mr. N. L. Britton detected a specimen of this species of plantain near New Dorp, the single spike of which was subtended by a whorl of leafy bracts. On the same excursion there was found in the woods, between New Dorp and Garretsons, a double-flowered specimen of *Rubus cuneifolius.*

Dr. Gray's note in the *Botanical Gazette* on a three-flowered bloodroot reminds me that a few years ago I found a specimen of dandelion with two well-developed capitula at the apex of the same scape. The scape in this instance was perfectly terete and smooth, and exhibited none of those striae which usually accompany cases of fasciation. The specimen is now in the State herbarium.

Fasciation in the peduncle of *Sophora*, as in the example shown by me at a recent meeting ot the Club, is not (as I am informed by the gentleman who sent the specimen from Texas) uncommon in this plant especially where the tree is in cultivation. It would be interesting to know whether the buds with which the flattened and striated peduncle is profusely covered produce deformed flowers. On several occasions, and in different localities, I have observed an example of fasciation in *Erigeron Canadense*, L., the stem of which was completely flattened and expanded to a width of three quarters of an inch, and terminated abruptly in a dense mass of leaves. This kind of deformity, which occurs so frequently in some plants (as in the cock's-comb for example) that it may be said to almost constitute their natural state, is brought about, according to the views of Dr. Masters and others, by the adhesion of buds that have been produced in some numbers and in close proximity, through superabundant nourishment—especially if this be accompanied by some check or injury.

Many interesting specimens illustrating the subject of Teratology, and many observations in regard thereto, have been brought to the attention of the Club from time to time, but unfortunately no account of them has ever been published. At the December, 1878, meeting Dr. Gross exhibited a case of median floral prolification in a rose, the prolonged axis of which bore a second full-blown flower. In a note to the *Scientific American*, Prof. F. L. Harvey, of Fayetteville, Ark., reports an instance of this nature in which, of two proliferous roses on the same bush, the axis of one bore five perfect flower buds, and that of the other, two. "Proliferous roses," says Dr. Masters, "have a special interest, inasmuch as they show very conclusively that the so-called calyx-tube of these plants is merely a concave and inverted thalamus, which, in prolified specimens, becomes elongated. Occasionally from the middle of the outer surface of the urn-shaped thalamus proceeds a perfect leaf, which could hardly be produced from the united sepals or calyx-tube."

I have specimens of *Centaurea Cyanus*, L., which I obtained from a garden a few years since, and which exhibit this same sort of prolification—the elongated axis bearing a second capitulum very slightly smaller than the primary one. At the same meeting of the Club, Dr. Thurber, after remarking that double flowers are rare in a state of nature, announced that he had recently received from Connecticut, specimens of *Nesaea verticillata*, H. B K., in which all of the flowers were double; and another member reported that he had observed, during the preceding spring, the same thing in a specimen of *Saxifraga Virginiensis*, Mchx. In the note before alluded to, Prof. Harvey states that he had seen a plant of some species of *Allium* in which a stamen, in a flower otherwise normal, was replaced by a bulblet; and in another flower, one of the stamens was replaced by a perfect flower. He says further: "An ear of corn, which has grown wrong side out, is in my possession. The ear has the form of an inverted truncated cone, bearing the kernels on the walls of the hollow. The cob has a smooth exposed surface, and a texture somewhat more compact than that of the cob of normal ears." This is perhaps a case of eversion of the axis, the termination of the latter becoming hollow through a disproportionate growth of the outer as contrasted with the central parts of the rhachis, and the female flowers and the seeds being borne on the walls of the tube thus formed.

W. R. G.

§ 52. **Publications.**—1. *Preliminary List of the Plants growing without cultivation in Alabama*, from the collections made by Eugene A. Smith, Tuscaloosa, and Charles Mohr, Mobile, compiled by Charles Mohr; 629 genera, ending with *Azolla Caroliniana*, Willd.; containing about 1,600 species and varieties, of which something like half are strangers to our region. We notice that Mr. Smith is the authority for *Asplenium ebenoides;* it would be interesting to know whether he found it in the locality discovered by Miss Tutweiler, or has a new station for this disputed species. This list is preliminary to a complete catalogue of the Flora of Alabama to be published hereafter in one of the Reports of the Geological Survey of the State. Those who have authentic specimens of plants not in the list are invited to communicate them to Messrs. Smith and Mohr.

2. *Forest Trees of North America.*—It is proposed to join to the Report on the Forest Wealth of the United States now in preparation for the Tenth Census, a Catalogue of the Forest Trees of North America, with special reference to their geographical distribution and economic properties and uses. To facilitate the collection and preservation of such information Prof. Chas. S. Sargent, Brookline, Mass., issues this preliminary catalogue, with blank pages for field notes and corrections. Any information which will serve to make the final publication more exact and complete will be gratefully received and duly acknowledged. Almost every botanist has it in his power to contribute something. Information on the following points is particularly needed.

1. The extreme geographical range of any species.
2. The region and elevation where any species is principally multiplied and reaches its greatest perfection.

3. The geological formation most favorable to the multiplication and development of any species.
4. Dimensions of remarkably developed specimens of any species.
5. The common or local name of any species in addition to those already given.
6. The purposes, however unimportant, for which the wood of any species is employed.
7. Products of any species other than wood, such as tannin, charcoal, dyes, potash, edible fruit, forage, etc.

3. *Catalogue of Trees and Shrubs, native and introduced, in the Horticultural Gardens adjacent to Horticultural Hall in Fairmount Park, Philadelphia.*—The purpose of this catalogue seems to be in part to furnish the visitors to the Park with some means of determining the names of the trees and shrubs which attract their observation. In consequence the arrangement is not strictly scientific, and the names are frequently those popular with gardeners in preference to the less known botanical denominations. The need of some guide to the name and character of the plants cultivated in places of public resort is obvious, if any educational purpose is to be served by such collections. But the plants should be conspicuously labelled, for the ordinary visitor has but slender opportunity to determine the botanical position of a tree or shrub whose acquaintance he desires to make. The CLUB made some effort to have this labelling done for Central Park, but without pushing the matter through. This catalogue will no doubt prove a great boon to those of the Philadelphia public who interest themselves in the vegetation of their noble park.

4. *The Bartram Oak*, by Isaac C. Martindale, read at the annual meeting of the West New Jersey Surveyors' Association, at Camden, 1st month 6th, 1880. In this interesting monograph of 24 pages Mr. Martindale has collected all the references to this much discussed oak. The typical specimen described by Michaux, found by him in a field belonging to Mr. Bartram, has long since been destroyed. The trees on the Bartram place which have been accredited as seedlings of the original, and have probably on this account contributed much to the doubts about its being a true species, are here supposed to be seedlings of *Quercus Phellos* and not of the original tree. Other specimens have been found growing wild up and down the Delaware, and, it is believed, in North Carolina and Texas. Mr. Martindale, upon a review of all the evidence and a personal knowledge of a number of the trees, is strongly of the opinion that *Quercus heterophylla*, Mchx., is a distinct species.

5. *Catalogue of North American Musci.* arranged by Eugene A. Rau and A. B. Hervey, A.M. This catalogue is designed to be a convenient check and exchange list and a basis for arrangement of genera, etc., in herbaria. The classification is mainly that adopted by Prof. Schimper in his Synopsis of European Mosses. All the authentic species and varieties reported from Mexico to the Arctic regions have been included, and their habitats given with as wide a range as the examination of references and several good herbaria would permit. The compilers acknowledge particular indebtedness to C. H. Peck, C. F. Austin and Chas. Mohr. It may

be obtained of Mr. Rau, Bethlehem, Pa., or Mr. Hervey, Taunton, Mass.

§ 53. **Botanical News** —*Annual growth of Trees.*—To the Journal of the Royal Society of New South Wales the Rev. G. E. Tenison-Woods contributes some interesting data in regard to the annual growth of trees. He states that a blue gum tree (*Eucalyptus globulus*), known to have been planted eighteen years previously, when cut down was found to have thirty-six concentric rings, *i. e.*, two for each year. As this tree, as well as *E. obliqua* and others, sheds its bark twice every year, he concludes that the sap rises twice a year in these trees.

Sizes of Leaves and Colors of Flowers.—According to the Gardeners' Chronicle, M. Ch. Flahault, in the *Annales des Sciences Naturelles*, brings forward additional observations to support his view that, under equal conditions, the leaves of plants of the same species are larger in proportion as we go northwards ; these relatively large dimensions being due to the duration of light of relatively feeble intensity. In cases where the chrophyll is formed in the absence of light it must be formed at the expense of the materials stored up in the tissues. The importance of these reservoirs of nutriment is still greater in the case of flowers. Thus, in the case of hyacinths, both blue and red, M. Flahault found no difference in the color of the flowers grown in the light or in the dark, the color being manufactured from the stores of materials in the bulbs.

Plant Hairs.—At a recent meeting of the Société Botanique de France, M. Poisson read a paper on "The Adaptive Character of Plant Hairs," and stated that in most climbing plants, as Darwin had shown with regard to the hop, *Galium aparine* and *Rubus australis*, the ridges alone of the stem are furnished with stiff hairs whose tips are bent downwards, while, in the intervals between the ridges, on the upper surface of the leaves, and on the inflorescence, etc., the hairs have a forward or horizontal direction. That these hairs are adapted to enable the plant to climb, is, he considers, evident from the fact that in the dwarf varieties of the haricot beans, which do not climb, these hairs have not a downward direction, and that in the *Loasaceae* and other families, it is the species which climb that alone present this form of hair. Of course, there are exceptions, such as *Dioscorea*, in which the leaves are glabrous, and the stem hairs not bent downward. M. Poisson proposes to turn to account the fact that, in the majority of cases, climbing or twining plants have recurved hairs, by using it as a means of judging from incomplete herbarium specimens whether the specimen is a climbing plant or not.

The April and May numbers of Trimen's *Journal of Botany* contain mostly continued articles ; the new papers are, in the April issue, "New Zealand Plants," by Dr. Berggren, and in the May, an article on "Some Dorset Plant-Stations," by the Rev. W. Moyle Rogers.

The *Botanical Gazette* for May contains notes on—"New Species of Potamogeton," by Thos. Morong ; "Notulae Exiguae," by Dr.

Gray; "Vitality of Seeds of Pinus contorta," by C. S. Sargent; "A Nolina in Colorado," by E. L. Greene; "Early Plants," by F. L. Harvey; "Crataegus tomentosa var. punctata," by E. F. Smith; "Winter Herborizations on Indian River," by W. W. Calkins; Recent Publications.

The first number of Dr. Engler's new botanical journal - the *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflangenzeographie*—has reached us, and contains articles by Oscar Heer, Alph. de Candolle, Eug. Warning, O. Beccari, and A. Engler, followed by a summary of the important works which appeared in 1879 on Systematic Botany, and on the history and distribution of plants. The novel feature has been introduced into this venture in botanical journalism of publishing communications in the language in which they were written.

Flora of the West Indies.—Baron Eggers, St. Thomas, West Indies, has undertaken to organize a complete exploration of the whole of these islands, especially of those less known. The imperfection of our knowledge of this Flora, and the importance of it in relation to that of North America are well known, and we wish Baron Eggers all success. We presume that the outcome will be a tolerably complete published account of the vegetation of these islands. Meanwhile Baron Eggers proposes to furnish subscribers with sets at very reasonable rates. Full information may be obtained of Baron Eggers, or Dr. Phil. Eug. Warning, Copenhagen, Denmark.

The American Monthly Microscopical Journal.—In the June number the Editor gives notice that he will begin work on the first part of Habirshaw's valuable Catalogue of the Diatomaceae at once, and that Part I. will probably be ready in July. This catalogue will be a complete index to all the published literature describing or figuring the Diatomaceae. The four parts are to be issued in rapid succession; and, as only a small number of extra copies will be printed, those who intend to subscribe should do so immediately.

From the June number of the lively *California Horticulturist* we learn that a new station for *Cheilanthes viscida*, Davenport, has been found at Aqua Caliente, in the same region as the original station, the Cañon of the White Water. This periodical pays a well deserved tribute to the late Charles C. Frost, the eminent cryptogamist of Brattleboro, Vermont.

§ 54. **Necrology.**—Charles C. Frost, one of the pioneers in the study of American Cryptogamous botany, and who was especially well known as a devoted student of the fungi, died at Brattleboro, Vermont, March 16th, in the seventy-fifth year of his age.

BULLETIN

OF THE

TORREY BOTANICAL CLUB.

Vol. VII.] New York, July, 1880. **[No. 7.**

§ 55. **Proceedings of the Torrey Club.**—The regular meeting of the Club was held at the College of Pharmacy, Tuesday evening, July 13th, the Vice-President in the chair, and ten members and three visitors in attendance.

There were exhibited a large number of species of *Chenopodiaceae*, from Staten Island, by Mr. Wright; specimen of tetramerous *Iris versicolor*, L., from Long Island by Mr. Schrenk; and a number of specimens of three-winged fruit of *Negundo aceroides*, Moench., and *Acer Pseudo-Platanus*, L., from Central Park. Mr. Schrenk reported that he had detected *Danthonia sericea*, Nutt, at Little Neck, L. I.

Mr. Brown read a list of ballast plants that he had discovered this season in the vicinity of New York, one of which (*Roubieva multifida*, Moq.) he exhibited. The complete list will be published hereafter.

Mr. Bicknell stated that he had recently detected *Melanthium Virginicum*, L., just north of the City limits. Mr. O. R. Willis reported the interesting discovery by him of *Narthecium ossifragum*, Huds., var. *Americanum*, Gray, at several places within one and a half miles of the village of White Plains, Westchester County. This plant has hitherto been found in the pine barrens of New Jersey only.

The subject of parasitic plants was again discussed, and Mr. Schrenk exhibited a glass slide on which were mounted the root fibres of the different plants among which the roots of *Monotropa uniflora*, L., had been found nestling—although no connection had been observed between them, These fibres were covered with brown fungus hyphae which answered to the description, given by other investigators, of the "byssoid fungi" or fibrous processes that envelop the roots of the *Monotropa Hypopitys*, L., and appear to communicate with the plants near which the latter grows. Mr. James Ware, of Stapleton, S. I., was elected an active member. One name was proposed for corresponding membership.

§ 56. **Field Meetings of the Torrey Club.**—The first field meeting of the season was held at West New Brighton, S. I., and the swamps about Clove Lake. The persons who took part in the excursion were Misses Beckwith, Dubois and Brown, and Messrs. Gross, Wright, Schoeny, Wilber, Britton and Gerard. Before proceeding to the woods the party visited the greenhouses and gardens of a veteran member of the Club, Mr. Wm. Charlton, and were afterwards entertained at a bountiful collation prepared by his hospitable wife. No new stations were discovered for plants already reported. The plant recorded as *Viola delphinifolia*, Nutt., in the "Flora of Richmond County," was found in abundance, and, on examination, discovered to be one of the many forms of that protean species, *V. cucullata*, Ait. *Viola striata*, Ait., was found here in profusion.

On May 22d, the Club visited Williams' Bridge, and followed the course of the Bronx river southward. The persons present were Misses Dubois and Adam, and Messrs. Leggett, Britton, Wilber, Schoeny, Gross and Gerard. Here new stations were discovered for the following plants: *Staphylea trifolia*, L., *Allium tricoccum*, Ait., and *Galium Mollugo*, L., along R. R., south of depot; *Arisaema, Dracontium*, Schott, in a swamp near the Bronx river; and *Isoetes riparia*, Engelm., on the river shore about opposite Fordham station.

On May 29th, five members of the Club—Messrs. Rudkin, Bower, Britton, Schrenk and Schoeny—visited the pine barrens, and explored the region lying between New Egypt and Manchester, and afterwards proceeded to Tom's River. At New Egypt, *Viola tricolor*, L. var. *arvensis*, DC., was found in some abundance, and seemingly a native. *Anthemis arvensis*, L. was observed to be rapidly spreading and becoming very common in the "Pines."

On June 5th, the field meeting was held at New Dorp, S. I., Messrs. Rudkin, Bower, Britton and Gerard being present. No new plants nor no new stations were discovered on this excursion.

§ 57. The Geological History of the North American Flora,

by J. S. NEWBERRY.

[*Abstract of a lecture delivered before the Torrey Botanical Club.*]

America is called the New World, but, so far as we now know, that portion of North America which lies immediately north of the St. Lawrence and the Great Lakes, with its southern extension, the Adirondack region, is the oldest portion of the earth's surface. This land area, sometimes wider, sometimes narrower, and gradually increasing, has continued to exist throughout all recorded geological time; hence it is not surprising that we have here the most complete and connected history of plant life. A brief synopsis of this history I shall attempt to give you this evening.

Previous to the Cambrian and Silurian ages, and the beginning of the *legible* life-record of the globe, a broad continental area occupied what is now the eastern half of North America. Whether this land bore any terrestrial vegetation we do not yet know. The Archaean rocks which compose it contain quantities of carbonaceous matter, now graphite, undoubtedly derived from plant tissue; but whether the tissue of land plants or seaweeds we have no means of knowing, in consequence of the complete metamorphism of the strata.

In the Lower Silurian age this old continent sank, and the sea flowed in over a large part of its surface. The beach formed by this invading sea we now call the Potsdam sandstone. Later deposits, which are like this, the direct wash of the land, frequently contain the impressions of land plants in abundance. In the Potsdam sandstone we have found none, and therefore we may infer that, if not absent, they were few in this age. Marine plants however were abundant, and the layers of the Potsdam sandstone are in a thousand places covered thickly with a network of interlacing stems of seaweeds, or rather their casts, because the vegetable tissue has all disappeared.

The limestones of this age—the organic sediments spread by the Silurian ocean over all the area it submerged—contain also abundant impressions of seaweeds, but no unequivocal traces of land vegetation. Some casts of plant stems found near Cincinnati have been described by Mr. Lesquereux as the remains of land plants, but in my judgment other proof of the existence of land vegetation in the Lower Silurian age must be furnished before we can make any positive assertion on the subject.

In the Upper Silurian age, narrower, but still extensive portions of our old continent suffered submergence, and in the deposits of this second sea we have indisputable evidence of the existence of land plants. These have been found in Michigan and Canada, and consist of the remains of ferns, lycopods, equiseta and conifers, but the specimens are small in size and comparatively few in number, and hence we may infer that land vegetation was not abundant. We are also warranted in the inference, since we have in this earliest known land flora the highest group of cryptogams—the acrogens, and the still higher gymnosperms—that this is not the real beginning of the land flora, and that something simpler and older existed and will probably be discovered. As before, there were seaweeds in great abundance in the Upper Silurian sea.

The subsidence which gave us the series of sediments we now call the Devonian system, was less extensive than those which took place before the area of permanent land was greater; and the proofs that this land was covered with a luxuriant, beautiful and varied terrestrial flora are conclusive. We have of course made but a beginning in the disinterment of the remains of this flora, but we have already learned enough of it to sketch in clear and strong lines its principal botanical features.

Dr. Dawson has described from the Devonian rocks of Canada and New York, more than a hundred species of Devonian fossil plants. These include conifers of several genera, ferns in considerable number, and not a few lycopods and equiseta. Within the United States the most interesting Devonian plants have been found in the Corniferous limestone of Ohio, and the Hamilton rocks of Gilboa, N. Y. In this age, a chain of islands ran down from Lake Erie to Tennessee, and, in the limestone which accumulated in the sea surrounding these islands, quite a large number of plant remains have been found. These seem to have been floated off from the Cincinnati island and water logged in the adjacent ocean. The trunks of tree-ferns representing three genera, with a number of smaller plants, have been already obtained from the insignificant excavations of the quarries at Delaware and Sandusky. At Gilboa we have the old shore upon which the plants grew, and here again we find tree ferns of several kinds, some of the trunks attaining a diameter of two feet, with *Nöggerathia*, supposed to be a cycad, *Lepidodendron*, a lycopod, and that singular *Psilophyton* of Dawson apparently connecting the lycopods and ferns, and widely diffused in the Devonian age.

The Carboniferous flora was but a continuation and expansion of the Devonian. It has been so fully revealed in our excavation of the coal beds, and has been so well studied, that all its general features have come to be familiar to every student of geology. No lengthy description of the coal flora, rich and interesting as it is, is therefore required here. I will only say in passing that the Carboniferous flora of America exhibits the same botanical characters as that of the Old World. A few genera and a large number of species are peculiar to America, but in all the great collections of fossil plants gathered from the coal strata of this country, there is perhaps no botanical element which has not also been noticed in Europe. It is impossible now to say how many species of plants have been obtained from our American Carboniferous rocks, for the literature of the subject is cumbered with much synonymy, and species have been multiplied by describing under distinct names the stems, leaves, and fruit of the same plant ; but at least five hundred distinct species have been described, and that number is being added to every year. Of those already known, probably half should be considered identical with some of those found in Europe ; and in some strongly marked and well-known species the identity is so complete that we cannot but wonder at the potency of the vital influence which held so closely to an elaborate pattern, organic structures inhabiting different quarters of the globe.

The Triassic and Jurassic floras were essentially alike in botanical characters. They both show a complete and surprising revolution in the vegetation of the globe in the passage from the Palaeozoic to the Mesozoic ages. By influences of which up to the present time we are ignorant, the great acrogenous flora of the Devonian and Carboniferous—consisting of gigantic lycopods and equiseta, the peculiar group of sigillarids, a few simple–leaved cycads, and many ferns—passed away "like a tale that is told" and, instead, without known transitional forms, arose the great cycadaceous flora of the Mesozoic. Here the lycopods have shrunk to insignificance, the sigillarids are extinct, the calamites with their allies, *Annularia* and *Sphenophyllum* are replaced by true *Equiseta*, the conifers and cycads multiplied until they constitute the most conspicuous forms of vegetation. These conifers were Araucarians; some with close rhomboidal appressed disks for leaves (*Brachyphyllum*), others with divergent fleshy scales (*Albertia*) like the Brazilian Araucaria of the present day, and still others with filiform foliage like the modern spruces (*Voltzia.*) The cycads were almost infinitely varied. Some were arborescent, with lofty trunks crowned with graceful canopies of nodding plume-like fronds, while others grew in spheroidal masses marked with rhombic leaf scars, suggesting to the first discoverer gigantic birds' nests (*Mantellia nidiformis*). Remarkable changes are also noticeable in the ferns. Those with highly compound fronds (*Sphenopteris*, *Pecopteris*, etc.), which existed in such vast numbers in the Carboniferous age, were to a great degree superseded by those with simple linear or spatulate fronds (*Taeniopteris*), and by those in which the stipe bore a horizontally–expanded pedate or spiral frond (*Camptopteris*, etc.) or broad pinnate or radiate fronds, like *Clathropteris*, of which the surface was divided into rectangular areoles by the strong nervation. All these forms were as unlike as possible to the ferns of the Palaeozoic ages, and had little resemblance to any that are now living.

Abundant remains of the Triassic flora are found in the rocks of this age at Richmond, North Carolina, in New Jersey, and in the Connecticut Valley. In certain localities vegetation was so luxuriant that it accumulated in the form of extensive and thick beds of peat, which are now coal. Associated with these coal beds near Richmond, and in the Deep and Dan River basins of North Carolina, we have a full representation of the plants from which the carbonaceous matter was derived, and no stronger proof of the wide difference between the floras of the Carboniferous and Triassic ages could be afforded than by the comparison of the plants preserved in the roof shales of the coal beds of Virginia and Pennsylvania; the first being Triassic, the second Carboniferous.

A large number of Triassic plants have also been found at the old copper mines near Abiquin, New Mexico, and at Los Bronces, Sonora, all representing the same botanical groups, cycads in large variety (*Otozamites*, *Podozamites*, etc.), a preponderance of monophyllous ferns, with a few of the finer-cut species.

Of the *Jurassic flora* of North America very little is known. The Triassic plants are for the most part from the upper members of the series, or Rhaetic beds of the Old World; and it is quite possible that the colored marls and clays which are found about Baltimore, forming the summit of the Trias, should be regarded as Jurassic. They have yielded quite a number of plants, principally cycads and finely divided ferns, all of new species.

Cretaceous Flora.—Nowhere in the world up to the present time has there been found an angiospermous leaf in the Triassic or Jurassic rocks. In India, China, Europe, America, the flora of the Jura and Trias has the character I have already ascribed to it ; but resting immediately upon these beds so full of cycads, conifers and ferns we find in New Jersey, and in innumerable localities in the far West, the Lower Cretaceous sandstones and clays, full of the remains of plants, and these altogether unlike those which had gone before.

From causes which we cannot as yet understand, nor even conjecture, the vegetation of the world was at this period of its history more completely revolutionized than at any previous epoch ; for here came in the angiosperms, by no transition indicated in the record, but by a sudden irruption. At the beginning of the Cretaceous age they seem to have spread over the earth's surface, and soon became the predominant and characteristic forms of vegetation, giving to Nature the aspect which she now exhibits.

In the Lower Cretaceous clays of New Jersey, and their equivalents, the Dakota group of the far West, the representatives of the Middle Cretaceous strata of the Old World, the remains of at least one hundred distinct species of angiospermous arborescent plants have already been found. With them are many conifers of Araucarian affinities, and fan palms like those of the present day ; but the forests that covered the continent when the Cretaceous sea invaded it consisted mostly of oaks, willows, sassafrases, magnolias, tulip trees, sweet gums—the genera most abundant in our living forests. Here, then, we have according to the present state of our knowledge the beginning of our modern flora. As to where it originated, and by what influence it was developed, we as yet have no information; but inasmuch as a long period of time is probably represented by the line which divides our Triassic or Jurassic and Cretaceous rocks, an interval in which the lowest members of the Cretaceous series were accumulating in the Old World, it is evident that we must go elsewhere to find the record of the gradual substitution of the angiospermous flora of the Chalk for the cycadaceous vegetation of the Trias and Jura.

In the studies that have been made of the foreign Cretaceous flora it is said that the change was gradual; first, a few angiosperms mingled with the predominating cycads and ferns; and subsequently, the angiosperms becoming more numerous. But it is also stated that no transitorial forms mark the passage from one flora to the other.

Descriptions of some of the Cretaceous plants of the far West were published in 1869 by myself, in a paper on our later extinct floras, which appeared in the *Annals of the N. Y. Lyceum of Natural History.* More recently a much larger number have been described by Mr. Lesquereux in one of the series of Dr. Hayden's Reports, devoted entirely to the Cretaceous flora.

Within the past year we have begun to open an herbarium of fossil plants in the Cretaceous beds of New Jersey, which promises to give us a more accurate knowledge of this flora than has been obtained from any other source. A large number of angiosperms and conifers have already been obtained from these beds, and Mr. Britton of this Society, will spend the coming summer in making further collections from the clays and sands along the Raritan River, so that when we meet again in the autumn I shall hope to be able to report some interesting results of this investigation.

Of the herbaceous and humbler elements of the Cretaceous flora we have as yet little knowledge, but the Cretaceous forest stands before us in well-defined characters. We rather pride ourselves now on the variety, beauty and majesty of our forest trees, but we have reason to believe that the forests of the Cretaceous included at least as large a number of species, and perhaps as imposing and beautiful individuals as those of the present day.

Since the Cretaceous flora consists of so many of the genera now growing in our climate, we must conclude that the climate which prevailed during the Cretaceous, within the area of our possessions, was also temperate, and that the theory somewhat widely promulgated that our flora began in the Arctic regions and spread south with the gradual decrease in temperature is without foundation in facts.

Tertiary Flora.—The flora of North America during the Tertiary ages seems to have been but a continuation of that of the Cretaceous. Many new genera and species were added, and a number of the latter are still in existence, but the botanical aspect of the flora was similar to that prevailing both before and after. During the Tertiary a mild climate extended over the entire North American continent, and as we know by the abundant remains of plants discovered in Alaska on Mackenzie's River, Disco Island and Greenland, a luxuriant flora similar in character to that of our Middle and Southern States was spread all along the northern sea-board. The remains of the living deciduous cypress, *Taxodium distychum*, have been found in nearly all the Tertiary deposits explored, even as far north as Greenland. The northern range of this species is now about the 36° of latitude, from which we may infer that the average annual temperature of the entire continent in the Tertiary age was above 50° Fahr. During this period there was a land connection between North America and Europe by way of Iceland and the Hebrides, and also with the Asiatic continent by way of Behring Strait. Taking advantage of this opportunity our American flora seems to have marched over and occupied both these continents. In Southern Europe the climate at the beginning of the Tertiary was sub-tropical, and the Indian Ocean communicated with the Atlantic through the Mediterranean. The gradual elevation of the Alps, Pyrenees, etc., during the Tertiary age, resulted in the formation of a barrier which limited the reach of austral influences and gave a temperate climate to the interior of Europe. At this time the American temperate flora descended from the north and occupied all Europe ; for we find in the Miocene or Middle Tertiary strata the remains of the deciduous cypress, our magnolias, the tulip tree, sweet gum, sassafras and the American poplars. When the Ice period came on, however, these plants were driven southward but found their retreat cut off by the Mediterranean, and were thus mostly exterminated. Subsequently, when a milder climate supervened, the vacant area thus formed was entered and possessed by a flora for the most part of Asiatic origin. In Japan and China, however, our American flora still exists. There is a remarkable similarity between the flora of Japan and that of Eastern America ; many of the species being identical, and others so closely allied that they must have had a common origin. We find, too, in China and Japan some interesting members of our American Tertiary flora, which, once common here, have been by some cause exterminated, while they still exist in Asia. Of these, perhaps the most striking examples are the *Salisburia* or ginko, a genus well represented in our Cretaceous and Tertiary flora, and the *Glyptostrobus*, another conifer which was abundant both in Europe and America in the Tertiary age, but, disappearing elsewhere, has survived in China.

I have said that our Tertiary flora was directly derived from the Cretaceous, and was the distinct progenitor of that of the present day. This is strictly true; but, if we may judge by the arborescent plants, our living flora is but a wreck and relic of that which covered our continent before the Ice period. We have already collected from the Tertiary strata in various parts of the country the remains of more species of forest trees than are now growing on its surface, and yet every year sees important additions made to the list. Imperfect as is the picture which these fragmentary fossils give us of the Tertiary flora, we find in it an explanation of some facts in the flora of the present day which have long puzzled botanists. For example, our giant trees, the two Sequoias of California, though of enormous size, are confined to very narrow geographical limits, the mammoth tree being restricted to a few groves ; so in our eastern forests the sassafras, the sweet gum, and the tulip tree are each a solitary representative of its genus, and it has been a matter of surprise that these noble and striking trees should have no living relatives ; but as we turn the pages of the Tertiary herbarium we find each of these genera represented by many species, and the species now living and restricted to narrow bounds, then having a very extended range, and existing in countless numbers. We find, too, that we have lost many of the grandest elements in the Tertiary flora; for example, our sycamores (*Platanus occidentalis*, and *P. racemosus*,) were in Tertiary times represented by a half dozen species which are now extinct, and of these, two at least would seem to have surpassed in magnitude and beauty our common one, great and grand as it is; for I have leaves of two extinct sycamores that are each one and a half feet in diameter. Camphor trees, palms, and figs were also features in our Tertiary flora which exist no longer outside of the tropics.

The most potent influence which operated to change the flora of the Tertiary to that of the present day was undoubtedly the cold of the Ice period. Although less destructive here than in Europe, because the southern extension of our continent offered a place of retreat before the advancing ice-sheet, the substitution of an Arctic climate for the mild temperature which prevailed in Tertiary times throughout the northern portion of the continent, and the spread of unbroken fields of snow and ice over all the surface north of the fortieth parallel, caused the destruction of all plant life over three-fourths of the area covered with the luxuriant growth of the Tertiary vegetation. It also forced the remnant into such narrow quarters that vast numbers of species were exterminated, and left the flora in the fragmentary condition it now exhibits. The effect upon the fauna was still more disastrous, for a forest tree needs no greater space than is occupied by its roots in the earth and its branches in the air, while the surface required for the support of one of the larger mammals is much greater. Hence of the grand Tertiary fauna scarce a remnant survived, while of the plants, when better days returned, and the snow fields and ice-sheets retreated to Greenland, a sufficient number came back from their banishment to cover the central portion of the continent with a flora which retained all the essential botanical characters of that of the Tertiary, but the vicissitudes through which it had passed had told sadly upon it. Many of its grandest and most beautiful elements had disappeared forever, while a few of its magnolias, tulip trees, sequoias and liquidambars survive as solitary representatives of the groups to which they once belonged, and form groves instead of boundless forests. Overtopping in their grandeur, or outshining in their beauty, their present associates, they attest the general magnificence of those ancient forests that were composed of their progenitors and extinct relatives, their equal or superiors.

§ 58. **Adiantum Capillus-Veneris,** L., in Kentucky.—On the 28th of last month I received the following letter from Mr. Linney, containing a small piece of this fern.

Harrodsburg, Ky.

"DEAR W.—Mr. E. H. Gaither of this place found last week under a cascade, ½ mile from Burnside's Point, Pulaski Co., great quantities of *A. Capillus-Veneris*, if that is this form. Yours,

W. M. LINNEY."

I at once wrote to Mr. Linney to send me the best specimen he could get from Mr. Gaither, and to give me all the particulars about the locality. He sent me four very good plants, two of them measuring

15 inches in length, including stipe. Regarding the locality, he further says: "The Cincinnati Southern R. R. crosses the Cumberland River in Pulaski Co., ½ a mile down from the bridge, where there is a cascade falling over sub-carboniferous rocks. Within, around, and beneath the fall is the *Adiantum* growing in great profusion."

I intend visiting the locality in about two or three weeks and will then write full particulars. John Williamson.

Louisville, Ky.

§ 59. **A Large Chestnut Tree.**—A fine specimen of *Castanea vesca*, L., var. *Americana*, Michx., stands in the township of New Barbadoes, Bergen County, N. J., half way between River Edge and New Milford stations on the N. J. and N. Y. R. R. about one hundred feet east of the railroad. The circumference at six feet from the ground is eighteen feet, which is slightly increased up to the first ramification at the estimated height of twenty-five feet. The very spreading and declining branches, themselves as large as ordinary trees, cover a space of ground not less than seventy-five feet in diameter. The tree is perfectly sound.

W. H. Rudkin.

§ 60. **On the Northward Extension of the N. J. Pine Barren Flora on Long and Staten Islands.**—The famous Pine Barren region of N. J. extends with few interruptions all the way from the Lower Bay of New York to Cape May and the mouth of the Delaware River. It occupies a narrow belt, near the Atlantic coast with its northern portion, but expands as it extends southward so as to include nearly the whole of Southern New Jersey. The Flora of this section of North America has long been widely known to include some of the rarest and most beautiful plants to be found on our continent, and has, therefore, been thoroughly explored by botanists from all sections of the country.

The soil of this region, as all who have travelled through it will bear witness, is generally extremely sandy, but is occasionally more firm, in places where strata of clay approach and form the surface.

The ages of the geological formations which occupy this territory are, Tertiary in the portion lying to the south and south-east of a line drawn from a point on the Atlantic coast a few miles south of Long Branch, to another near the head of Delaware Bay; and Cretaceous, north of this line, and extending between it, and the southern edge of the Triassic formation, which follows a line from the centre of Staten Island to the vicinity of Trenton.

As the soil over both the Cretaceous and Tertiary is composed of similar materials, it is impossible to say, from surface indications just where one ends and the other begins.

The Tertiary pine barrens extend southward along the Atlantic coast to Florida; it is with the Flora of the northern extension of these sandy stretches, of *Cretaceous* age, with which we have to do at present. On Staten Island these strata are exposed in its extreme southern portion, occupying an area of perhaps one-fifteenth of the county; they doubtless extend over the entire southern and eastern sections, but are there mostly covered by a layer of material of variable thickness derived from the Glacial Drift. In places this layer is very thin, and sandy soil appears. On Long Island the terminal moraine of the glacier occupies a position marked by a range of hills extending throughout its whole length, at an average distance of ten miles from the Atlantic. South of these hills, which have been appropriately called the backbone of the island, sandy plains prevail, the material composing them having been formed partly from the modified drift of the hills and partly from the underlying Cretaceous strata. In Suffolk County these plains occupy a considerable surface, and their flora has been very thoroughly worked up by our fellow member, Mr. E. S. Miller. The object of this paper is to call special attention to the number of characteristic plants of the New Jersey pine barrens which have already been detected in Staten and Long Islands, and which are recorded in the pamphlets, "The Flora of Suffolk County," and "The Flora of Richmond County," and their addenda.

First we will consider those species hitherto detected on the Creteceous soils of Staten Island, and not found on the Drift; there are 34 of these plants, and they are as follows:—*Magnolia glauca*, L.; *Hudsonia ericoides*, L.; *Ascyrum Crux-Andreae*, L.; *Arenaria squarrosa*, Michx.; *Polygala lutea*, L.; *Tephrosia Virginiana*, Pers.; *Desmodium laevigatum*, DC.; *Desmodium viridiflorum*, Beck; *Rubus cuneifolius*, Pursh.; *Crataegus parvifolia*, Ait.; *Eupatorium rotundifolium*, L.; *Aster nemoralis*, Ait.; *Aster concolor*, L.; *Chrysopsis Mariana*, Nutt.; *Gnaphalium purpureum*, L.; *Gaylussacia dumosa*, T. & G.; *Andromeda Mariana*, L.; *Kalmia angustifolia*, L.; *Ipomoea pandurata*, Meyer; *Phlox subulata*, L.; *Asclepias obtusifolia*, Michx.; *Euphorbia Ipecacuanhae*, L.; *Quercus nigra*, L.; *Quercus prinoides*, Will.; *Quercus Phellos*, L.; *Spiranthes simplex*, Gray.; *Juncus scirpoides*, Lam., var. *macrostemon*: *Xyris flexuosa*, Muhl., Chap.; *Cyperus cylindricus*, N. L. B.; *Stipa avenacea*, L.; *Glyceria obtusa*, Trin.; *Panicum verrucosum*, Muhl.; *Andropogon macrourus*, Michx.; *Lycopodium inundatum*, L., var. *Bigelovii*, Tuck.

Of these the following four have not been detected in Suffolk County:—*Desmodium viridiflorum*, Beck.; *Rubus cuneifolius*, Pursh.; *Ipomoea pandurata*. Meyer.; *Phlox subulata*, L.

In addition to the above list, however, the following sixteen additional species have been detected in Suffolk County:—*Drosera filiformis*, Raf.; *Ascyrum stans*, Michx.; *Eupatorium hyssopifolium*, L.; *Eupatorium leucolepis*, T. & G.; *Eupatorium album*, L.; *Aster spectabilis*, Ait.; *Solidago puberula*, Nutt.; *Chrysopsis falcata*, Ell.; *Helianthus angustifolius*, L.; *Coreopsis rosea*, Nutt.; *Utricularia subulata*, Le Conte.; *Cupressus thyoides*, L.; *Juncus pelocarpus*, E. Meyer; *Xyris Caroliniana*, Walt.; *Eleocharis melanocarpa*, Torr.; *Sporobolus serotinus*, Gray.

Thus it appears that 34 of these characteristic pine barren plants grow in the southern part of S. I., and that 46 of them have been detected in Suffolk Co., L. I. I have no doubt that these lists will be augmented by future explorations.

As we proceed eastward from L. I., we find that there are a few of these same plants growing on soil of Tertiary age in the southern parts of the Eastern States; and it would seem that these species have a tendency to follow the course of the two more recent geological formations, throughout their whole extent along the Atlantic coast. Another fact which stands out prominently in this connection, is that not a single one of the above-mentioned plants, growing, as we have seen, just along the edge of the mantle of Glacial Drift is native of Europe; that is, they belong to a true American flora, which had its origin in the southern part of the continent. In contrast to which fact, we have another one, equally prominent, and that is, that of the species of plants growing on the material brought down by the ice sheet, about one-third are common to northern Europe and America, thus pointing to a common origin of each in the territory now occupied by the ice and snow of the Arctic regions.

N. L. Britton.

§ 61. **Teratology.**—*Lilium candidum* often has the uppermost flower 5–merous; all that I have noticed this year were so. I have seen 6–merous *Sarracenia purpurea*, and 4–merous *Tigridia*—the large cultivated species, (*Pavonia?*). D. C. E.

§ 62. **Botanical News.**—Trimen's *Journal of Botany* for June contains:—A Review of the British Characeae (2 plates), continued, by H. and J. Groves; Remarks on Botanical Nomenclature, by B. Daydon Jackson; Botany of the British Polar Expedition of 1876-7, by H. C. Hart; Wilhelm Philip Schimper, by W. Carruthers.

The *Botanical Gazette* for June contains the following notes:—Vitality of the Seeds of Serotinous Cones, and Fraxinus quadrangulata hermaphrodite, by G. Englemann; Notulae exiguae, by A. Gray; Platanthera bracteata, and Double Thalictrum anemonoides, by T. Meehan; Cobaea scandens proterandrous, by W. W. Bailey; Notes on certain Silkweeds, by Edward L. Greene; Notes from Florida, by A. H. Curtiss; A Natural Botanic Garden, by J. M. Coulter; Some Plants of Franklin County, Ky., by R. H. Wildberger; and Notes from Illinois, by H. L. Boltwood.

The *Gardeners' Chronicle* states that at the meeting of the Linnean Society on June 3, a paper was read by Mr. George Murray "On the Application of the Results of Pringsheim's Recent Researches on Chlorophyll to the Life of the Lichen." Summarizing the results of Pringsheim's labours, the author considered the suggestion of Dr. Vines that, by the aid of an artificial chlorophyll screen, the protoplasm of fungi might be excited to the decomposition of carbonic acid, and contended that this proposed experiment is proceeding naturally in lichens. He pointed out that in these organisms we have the fungal tissues in the body of the thallus, and the chlorophyll screen in the gonidia; and that light traversing the chlorophyll-containing gonidia—often occuring as a dense layer—excites in the fungal tissues the decomposition of carbonic acid. In evidence he adduced the plentiful occurence in the fungal hyphae of starch, or rather lichenin—a substance of the same chemical composition as starch $C_{12}H_{10}O_{10}$

and formed from it by the action of the free acids of the plant. In conclusion, he submitted that this process tended to explain the nature of the consortism of the fungal and algal elements in the lichen, and thus to support the views of Schwendener.

In *Nature* for June 17, Dr. A. Ernst, of Caracas, gives a very interesting account of the fertilization of *Cobaea penduliflora*, Hook. f., a species closely allied to the *C. scandens* so common in cultivation. He finds that the disk only secretes nectar immediately after the anthers burst, and that it is then produced in considerable quantity, and that unless the plants are cross-fertilized the same night, either by moths or artificially, the fruit is not developed. "As soon as the corolla has fallen off, the peduncle withdraws slowly amongst the dense foliage where the fruit develops, protected from all kinds of injury."

The current number of Case's *Botanical Index* has, among its varied contents, a communication from a Canadian correspondent in regard to a monstrous specimen of *Fuchsia*, and which is apparently, from the description and accompanying figure, a case of pleiotaxy or repetition of the calyx. The *Fuchsia* does not appear in the short list of those plants in which this kind of change has been observed to occur by Dr. Masters and others.

Grevillea for June contains: An introductory List of Desmidiaceae found in the British Islands, since Ralf's Desmidieae; Observations on Peziza by M. C. Cooke; Hymenochaete and its allies, by M. C. Cooke; Fungi of Australia, by C. Kalchbrenner; Dacrymyces succineus, by W. Phillips.

Some observations, which will prove of interest to those engaged in the study of the algae, have been made by Herr Stahl on the motion caused by the effects of light on some minute species belonging to the Conjugatae. He finds that *Closterium moniliferum*, one of the Desmids, under diffuse daylight of little intensity, presents its longitudinal axis to the light rays, one-half of the cell being alternately attracted and the other half repelled, so that both halves are equally exposed to light. When the intensity of the light was increased the cells changed their position, and placed themselves at right angles to the incident light.

The *Gardeners' Chronicle* (July 10) gives an illustration of a peloric orchid, which at first sight so much resembles a flat-petalled iris that it might well be mistaken for one. It represents a flower of *Laelia purpurata* in which the three sepals were equal in size and shape, as also were the three petals—the latter being all deeply colored and lip-like. In the centre of the flower was a three-toothed column with no anthers. Below the flower were indications of a three-celled ovary, the cells being placed opposite to the sepals. Allowing for the absence of the stamens, the diagram of the flower was exactly that of an iris. From the same number of the *Chronicle* we learn that the entire cryptogamic herbarium (including original drawings, dissections, and notes) of the late Prof. W. P. Schimper, of Strasburg, whose important works upon mosses are so well known, has been purchased by the Baroness Burdett Coutts, and presented to the Herbarium of the Royal Gardens, Kew.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VII.] New York, August, 1880. **[No. 8.**

§ 63. **Fern Notes.**—In re-arranging the specimens in the "Davenport Herbarium," I noticed quite a number of examples of bifurcation that it may be of interest to place on record.

In *Polypodium vulgare* examples occur with bifid fronds and segments. In *P. Californicum* and *P. falcatum* no examples occur; but in these two species the segments are frequently coarsely and deeply serrate.

In *Notholaena Parryi* an example occurs in which the stipe forks midway and branches into a double frond. Similar examples of "twin-fronds" occur in *Camptosorus*, *Asplenium Trichomanes*, and *Woodsia obtusa.*

In *Cheilanthes Cooperae* one frond forks just above the second pair of pinnae into two divisions nearly three inches long.

Cheilanthes Clevelandii has several specimens of bifid fronds, and *Pellaea atropurpurea*, of bifid fronds and pinnae.

Some sections of *Pteris aquilina* var. *lanuginosa* have bifid pinnae and pinnules.

Scolopendrium and *Camptosorus* especially delight in such manifestations; the former exhibiting some deeply bifurcated fronds, and the latter some curious freaks. Two examples of "twin-fronds," exactly as described by Mr. Tweedy in the BULLETIN, Vol. VII. p. 26, occur, and one in which the long-attenuated apex bifurcates into two long proliferous tips. Mrs. Barnes contributes some curious abnormal forms of this species from Onondaga Co., N. Y.

Asplenium ebeneum, besides its proliferous fronds, *A. Montanum* and *A. firmum*, all bifurcate more or less deeply, as do also *Aspidium acrostichoides*, *A. Thelypteris*, and *A. Noveboracense.*

In *A. spinulosum* and varieties, double-fronded, bifurcate and crested forms occur, and also in *Cystopteris fragilis* and *Dicksonia.*

Woodsia glabella has one example of a bifid frond, and in the *Botrychia* all sorts of freaks occur—sterile sections transformed into fertile, and vice versa; bifid stalks; and extra fertile spikes growing either out from the main stalk or from the axils of the sterile divisions.

The Herbarium is now in perfect order, with an "Index" for reference. The collection contains nearly 600 mounted sheets, and over 2,000 specimens, but is deficient in *root specimens* of the following: *Gymnogramme hispida*, *Notholaena ferruginea. N. Hookeri*, *N. nivea* (of which I have some fragments collected on Lone Mountain, New Mexico, early in June, 1880, by Wm. M. Courtis), *N. tenera*, *Cheilanthes Wrightii*, *C. Lindheimeri*, *C. cucopoda*, *Pellaea aspera*, *P. pulchella*, *P. flexuosa* and *P. ternifolia. Complete root specimens* of any of these are desired and solicited.

Since the publication of my Catalogue, many new forms have been added, and I have to thank Mr. Lemmon for *Aspidium Mohrioides*; Dr. J. Schneck for *Aspidium Oreopteris*; J. Donnell Smith for a fine series of specimens of *Aspidium conterminum*, var *strigosum*; W. G. Wright and the Parish Bros. for additional and fine series of specimens of *Cheilanthes viscida.*

Notholaena Lemmoni has not yet been added to the Herbarium. *N. nivea* appears to have been collected nearly simultaneously in Arizona by Lemmon (vide June BULLETIN) and in New Mexico by Courtis.

GEO. E. DAVENPORT.

§ 64. **Artificial Synopses.**—Since the adoption of the natural system of classification, recourse has been had to "artificial keys," to a greater or less extent, for the purpose of facilitating the determination of species. There is a tendency to overlook the natural relationship of plants, growing out of the use of these keys, which can only be avoided by a careful study of the principles of classification in general and its application to botany in the morphological and structural relations of the members of the vegetable kingdom.

A wrong impression is often tacitly conveyed to students just commencing the study, namely, that the chief end of the "analysis of plants" is to determine botanical names, when this is really a matter of convenience of secondary importance; while the first object should be *the determination of the structural characteristics of the plant in hand*, which at once distinguish it from all others, and indicate its relation and position in the vegetable kingdom. If the more modern plan of imparting botanical instruction were rigidly carried out, namely, requiring the student to write *in accurate botanical language* the diagnostic characters of every plant studied in the preliminary course of instruction (say 50 or 75 plants), the number of those whose early habits of study will remain a stumbling-block in the further pursuit of botanical knowledge would be vastly decreased, and the number of those who become intensely enthusiastic in the science, and capable of thorough and systematic post-graduate study would receive a corresponding increase. To such, artificial keys are useful in economizing time, while the knowledge of structural relationship will not be concealed or overlooked in the abbreviated process.

A "manual" for beginners is useful in proportion as it is accurate and easy of application. Some of our botanical orders containing our most common plants are difficult for beginners chiefly for the reason that the generic and specific "synopses" of the text-books are founded on characters not readily determined, or are of themselves difficult of application, requiring a vast amount of searching to find the appropriate division. The following synopses may be found useful in the determination of species in a few of these difficult orders after the characters of the plants are carefully noted. I have found it convenient in studying the *Salicaceae* to mark those species whose catkins appear before the leaves, with numbers wired to the plant; greater accuracy is thus insured and the variations in the same plant from year to year may be also studied with profit.

ARTIFICIAL SYNOPSIS OF THE UMBELLIFERAE.

A	Umbels simple or irregularly compound	B.
	Umbels regularly compound	D.
B	Leaves with no true blade	CRANTZIA.
	Leaves simple	C.
	Leaves 2–3 ternately divided	ERIGENIA.
C	Leaves linear or lanceolate	ERYNGIUM.
	Leaves orbicular or reniform	HYDROCOTYLE.
	Leaves palmately lobed or parted	SANICULA.
D	Flowers white or greenish	E.
	Flowers yellow or purple	Q.
E	With hollow petioles in place of leaves	TIEDEMANNIA.
	Leaves finely dissected	DISCOPLEURA.
	Leaves pinnately divided or compound	F.
	Leaves ternately divided or compound	I.
F	Involucre several leaved	G.
	Involucre almost wanting	H.
G	Carpels bristly	DAUCUS.
	Carpels five-ribbed, otherwise smooth	SIUM.
H	Leaves simply-pinnate	ARCHEMORA.
	Leaves 2-3 pinnate	CONIOSELINUM.
I	Involucre almost wanting	J.
	Involucre more conspicuous	N.
J	Leaves trifoliate	CRYPTOTAENIA.
	Leaves 1-3 ternate	K.
	Leaves ternately decompound	CHAEROPHYLLUM.
K	Involucels bristly	EULOPHUS.
	Involucels few leaved	AETHUSA.
	Involucels many leaved	L.
L	Marginal flowers radiant	HERACLEUM.
	Flowers uniform	M.
M	Carpels with three slender ribs; calyx obsolete	ANGELICA.
	Carpels with three stout ribs; calyx teeth short	ARCHANGELICA.
N	Leaves 2-3 ternate	O.
	Leaves decompound	CONIUM.
O	Carpels bristly	OSMORRHIZA.
	Carpels ribbed, not bristly	P.
P	Fruit elliptical; involucels linear	LIGUSTICUM.
	Fruit subglobose; involucels many leaved	CICUTA.
Q	Leaves simple, entire.	BUPLEURUM.
	Leaves pinnately divided or compound	R.
	Leaves ternately divided or compound	S.
R	Involucels bristly	POLYTAENIA.
	Involucels small or none	PASTINACA.
S	Leaflets entire	ZIZIA.
	Leaflets incised	THASPIUM.

[The caraway (*Carum carui*) is thoroughly naturalized in Central New York, and is even becoming a troublesome weed in some places. It is not in the Manual and so we suppose has here been omitted. One meeting with it would be brought to " H " of the synopsis.—EDS]

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SYNOPSIS OF THE NORTHERN CARICES.

The numbers refer to the species described in Gray's Manual (edition and issue of 1868).

A	Spike solitary	B.
	Spikes two or more	E.
B	Spike dioecious	No. 1-2.
	Spike androgynous	C.
C	Spike staminate at summit	D.
	Spike staminate at base	Nos. 1, 2, 36, 138.
D	Bracts and scales of fertile flowers leaf-like	No. 7-9.
	Bracts and scales never foliaceous	No. 3-6.
E	Stigmas 2	F.
	Stigmas 3.	I.
F	Spikes dioecious	Nos. 11, 33.
	Spikes androgynous	G.
	Spikes monoecious	H.
G	Pistillate flowers below	No. 13-28.
	Pistillate flowers above	No. 29-45.
	Pistillate flowers variously situated.	No. 10-12.
H	Staminate spike solitary	No. 65.
	Staminate spikes 1-3	No. 46-56.
I	Staminate spike solitary	J.
	Staminate spikes 2 or more	W.
J	Perigynia with merely a point without a beak	K.
	Perigynia with a distinct beak	N.
K	Perigynia smooth	L.
	Perigynia hairy	M.
L	Scales black, purple, or brown	No. 46-64.
	Scales brownish, tawny, or white	No. 65-81.
	Bracts green and foliaceous	No. 84-91.
	Bracts reduced to colored sheaths	No. 92-3.
M	Bracts narrow, foliaceous	No. 82-3.
	Bracts reduced to colored sheaths.	No. 92-3.
N	Perigynia not at all or only slightly inflated	O.
	Perigynia moderately or much inflated	U.
O	Perigynia smooth	P.
	Perigynia hairy	S.
P	Beak entire	No. 102-3.
	Beak two-toothed	Q.
Q	Perigynia only slightly inflated	R.
	Perigynia moderately inflated	No. 120 7.
R	Perigynia few nerved or nerveless	No. 104-110.
	Perigynia nerved, tawny-yellow at maturity	No. 111-115.
S	Bracts short, leaves all radical	No. 94-101.
	Bracts leafy, long	T.
T	Perigynia slightly inflated	No. 102-3.
	Perigynia moderately inflated	No. 120-7.
U	Perigynia conspicuously nerved	V.
	Perigynia few nerved	No. 137-8.
V	Perigynia moderately inflated	No. 120-7.
	Perigynia much inflated	No. 128-36.

W	Perigynia not at all or only slightly inflated	X.
	Perigynia moderately inflated	No. 120-7.
	Perigynia much inflated	No. 139-151.
X	Perigynia with merely a short point	Y.
	Perigynia with a distinct beak	No. 116-19.
Y	Scales black, purple, or brown	No. 46-64
	Scales brownish becoming white	No. 71.

Synopsis of the Northern Species of Salix.

A	Catkins sessile appearing before the leaves	B.
	Catkins lateral with 4-5 leafy bracts at base	I.
	Catkins borne on the summit of lateral leafy shoots of the season	J.
B	Ovaries stalked	C.
	Ovaries sessile or nearly so	H.
C	Leaves entire or obscurely wavy toothed	D.
	Leaves serrate	F.
D	Leaves petioled	E.
	Leaves almost sessile; shrub 1°-1½° high	*S. tristis.*
E	Leaves taper-pointed; ovary densely woolly	*S. candida.*
	Leaves abrupt at apex; ovary silvery hairy	*S. humilis.*
F	Leaves smooth above	G.
	Leaves downy above; stigma sessile	*S. sericea.*
G	Leaves finely and evenly serrate	*S. petiolaris.*
	Leaves irregularly toothed, entire at base and apex	*S. discolor.*
H	Filaments united; leaves oblanceolate	*S. purpurea.*
	Filaments separate; leaves linear-lanceolate	*S. viminalis,*
I	Ovary smooth, lanceolate	*S. cordata*
	Ovary silky hoary, almost linear	*S. livida* var. *occidentalis.*
	Ovary silky, ovoid conical	*S. chlorophylla.*
J	3° or less high	K.
	Trees; 12°-80° high	M.
K	Stem upright	*S. myrtilloides.*
	Prostrate or spreading; alpine species	L.
L	Ovary smooth, sessile	*S. herbacea.*
	Ovary smooth, short-stalked	*S. Cutleri.*
	Ovary silvery silky	*S. argyrocarpa.*
M	Stamens 3-6 or more; ovary stalked, glabrous	N.
	Stamens 2; ovary nearly sessile, glabrous	O.
	Stamens 2; ovary stalked, downy	*S. longifolia.*
N	Pods taper-pointed; stamens 5	*S. lucida.*
	Pods short ovate; stamens 3-6	*S. nigra.*
O	Leaves smooth, glaucous beneath	*S. fragilis.*
	Leaves silky beneath	*S. alba.*

Lucien M. Underwood.

§ 65. **Ophioglossum palmatum,** Plumier.—Truly, many and queer are Nature's freaks in shaping leaves, but I think she really surpasses herself in the odd forms she uses in the manufacture of *Ophioglossum palmatum.* Of about thirty specimens of this rare plant, which I received from the Indian River country last summer, scarcely any two had any particular resemblance to each other. If a child had taken scissors and cut out the leaves, snipping out notches here, and leaving prolonged points there, while abruptly snipping them off in still other places, no queerer shapes could be found. They are grotesque and misshapen; not one can be called "pretty" (though the texture of the frond is daintily thin), and the fruiting-spikes always vaguely remind me of rattlesnakes and their rattles. Fronds simple and ovate, lanceolate or broadly wedge-shaped; or two-lobed, one lobe twice as long as the other, and both knocked over on one side at right angles to the stem; or three, four or five-lobed with short upper lobes and a much-pulled-out lateral lobe; obtuse, acute, scalloped, square or emarginate tips; the variety is endless. The fruiting-spikes vary in number, some of the smallest fronds only an inch or two long, stem and all, and less than an inch wide, bearing three or four; while larger ones, with stem three or four inches long and blade two inches long by same breadth, can scarcely perfect one good spike.

ST. AUGUSTINE, FLA. MARY C. REYNOLDS.

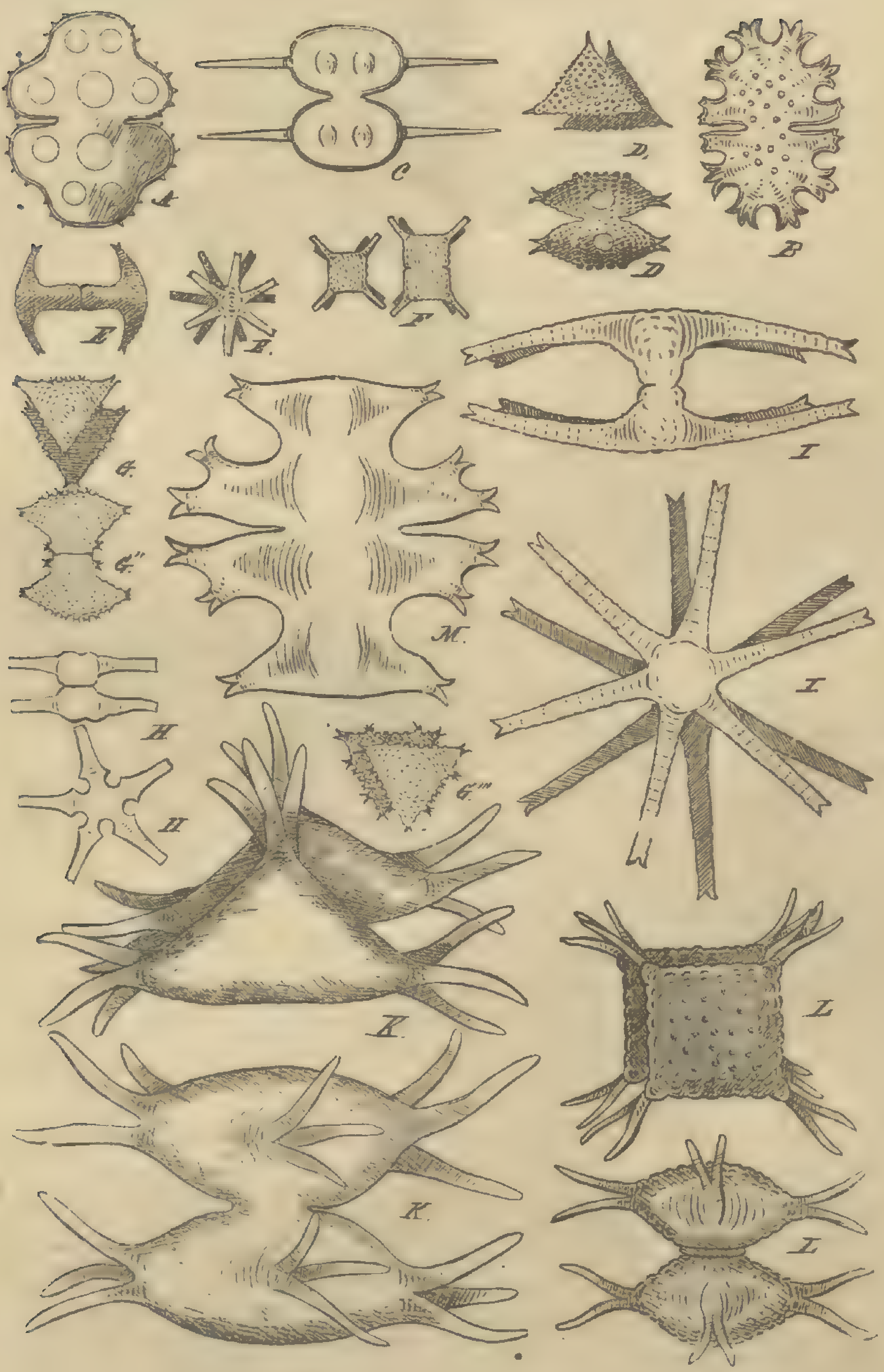
§ 66. **A New Sphaeria on Grapes.**—In the early part of the present month (May, 1880) my friend, Dr. E. C. Bidwell, of Vineland, N. J., wrote me that he had found the ascigerous form of the fungus to which *Phoma uvicola* belongs. The grapes on which the fungus in question was found had been struck with the rot last season, and were still hanging dry and shrivelled on the vines and well covered with the *Phoma*. Dr. B., who has for some years past been investigating the grape-vine fungi, placed for the purpose of experiment some of these shrivelled grapes in water where they were allowed to soak for three or four days. At the expiration of this time many of the perithecia (which before contained only spores of the *Phoma*) were now filled with well-developed asci, in which the sporidia were not yet fully matured. Having read the account of Dr. B.'s discovery, I at once examined the grape-vines in my own vicinity, and found lying on the ground under the grape trellis a few shrivelled grapes, which afforded some ascigerous perithecia, together with an abundance of *Phoma*. These grapes, perhaps from the fact of their having lain on the ground where they had imbibed a greater amount of moisture, were in a more advanced stage of development than those hanging on the vines.

The fungus in question is a *Sphaeria* of the section *Subtectae*, Fr., and in honor of its discoverer is here proposed as

Sphaeria Bidwellii., *n. sp.*, briefly characterized as follows: S. peritheciis minutis globosis epidermidi tectis demum suberumpentibus, apice poro pertusis; ascis clavate-cylindraceis obtusis .0027′x .0005,′ sporidias, octo irregulariter ellipticas vel oblongas (continuas ?) .0005′–0007′x.00015′–.0002′ foventibus; paraphysibus nullis.

The specimens thus far examined appear not to be fully mature, the sporidia being filled with granular matter and a few oil globules, so that their ultimate shape cannot now be perfectly defined. There appears to be quite a variation in their form, from regularly elliptical

Bulletin Torrey Botanical Club. Plate V.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NEW AMERICAN DESMIDS.

to oblong. This latter form has only been observed in *free* spores, which appear, however, to be true sporidia. J. B. ELLIS.

NEWFIELD, N. J., *May* 26.

Since found also on old grape petioles and twigs of last year's growth. J. B. E.

§ 67. **Adventitious Leaves in Rhus.**—A malformation occasionally makes its appearance in *Rhus glabra*, L., in the vicinity of New York, and may perhaps be common to this species wherever it grows. The deformity consists in the entire (rarely partial) substitution of a dense mass of narrow, simple crispate leaves for the inflorescence. This condition is accompanied by a change in the form of the uppermost leaves; these being sometimes simple, with laciniate margins, and sometimes pinnate, with deeply-cleft leaflets, and partially-winged petioles. Occasionally this deformity is not observed in a given locality for several years, and then again it makes its appearance and is quite common. This year it has been observed near Tenafly, N. J., at White Plains, and on Long Island in the vicinity of New York.

§ 68. **New American Desmids.**—The figures in the accompanying plate (Plate V.) illustrate the new species of *Desmidiaceae* described by me in the April number of the BULLETIN, pp. 45-47:— A. *Euastrum Donnellii*; B. *E. formosum*; C. *Arthrodesmus fragilis*; D. D. *Staurastrum subarcuatum*, front and end view; E. E. *S. comptum*, front and end view; F. *S. pusillum*, front and end view; G. G. G. *S. fasciculoides*, front and end view, and variety; H. H. *S. pulchrum*, front and end view; I. I. *S. macrocerum*, front and end view; K. K. *S. tricornutum*, front and end view; L. L. *S. Nova-Caesareae*, front and end view; M. *Micrasterias Kitchellii*, front view. FRANCIS WOLLE.

§ 69. **Nectar, its Nature, Occurrence, and Uses,** by William Trelease, Ithaca, N. Y., with illustrations. *From the Report on Cotton Insects, by J. Henry Comstock, Entomologist to the United States Department of Agriculture.* In a preliminary note Mr. Trelease says: "Since nectar is found in several parts of the cotton plant, and presents some peculiar phenomena there, it has been thought best that I should treat briefly in this place of its occurrence and economic value; hence the present essay. My plan has been to indicate what I understood by the word nectar; to describe some of the more instructive instances of its occurrence, in an order depending entirely upon the nectariferous organs; to arrange them according to the purpose which the nectar serves in each case; to discuss some of the cases more at length and, finally, to briefly mention the habits of some nectar-loving animals when in quest of this beverage. Though limited time and prolonged ill-health have prevented me from making this essay what I wished it to be, I trust that it may not be found wanting in what it professes to be—an outline of the uses of nectar as we now understand them." After a discussion of the various definitions of nectar, the author gives the following:

"Nectar—a fluid always sapid, usually sweet, often odorous, which is elaborated in any part of a plant, remaining where formed or making its way to some other part; its *raison d'être* being the necessity for the removal of some useless or injurious substance, or as some provision to attract nectar-loving animals to the plant for some definite purpose." This is rather long for a definition, and it might be objected that it includes resinous exudations. After grouping the various positions of the nectaries under the general heads of floral or extra-floral, Mr. Trealease discusses specially those on the several divisions of these parts.

On the cotton plant the most copious source of nectar is the base of the bracts which surround the flower, and to it, are attracted many ants, wasps and bees, and during the night previous to the flowers unfolding, thousands of the moths whose larvae are most destructive to the flowers and fruit. "So it appears that the secretion of these glands first attracts the worst enemies of the plant, and then attracts their enemies, which afford it partial relief from the misfortune that it has brought on itself."

The whole essay will be found entertaining and instructive. Appended is a very valuable index to all books or articles treating of nectar and the fertilization of flowers in general.

§ 70. **Irritability in Robinia.**—The *Comptes rendus* of the French Academy (Tome XC. No. 21) contains a note by Mr. T. L. Phipson on the development of irritability in *Robinia Pseudacacia*, L. The author tried some experiments last year to ascertain whether he could produce in this tree phenomena of sensitiveness (or excitability, to use Dutrochet's term) like those observed in the sensitive plant. His first experiment was made at half-past five o'clock in the afternoon of Sept. 17th, while the sun was shining brightly. He found that on subjecting the terminal leaflet to 10 to 20 quite strong raps with his finger, the lateral leaflets soon began to approach each other, and that at the end of five minutes the whole leaf was in the same state of "sleep" as at midnight.[1] The lateral leaflets closed up one after the other, beginning with the one nearest the terminal leaflet, just as they are observed to do in the sensitive plant. The author found that it afterwards required two or three hours strong sunshine to cause the leaflets to expand and resume their horizontal position. Subsequently, he tried the effect of strong heat on the terminal leaflet, and found that he could burn it to a crisp without affecting the lateral leaflets—a result directly opposite to that obtained in a like experiment with the sensitive plant. From this he concludes that the sap moves more slowly in the former than in the latter plant. From these experiments the author believes that he has obtained additional evidence in support of an opinion put forth by him in 1876, that: "The reason why the movements of the sensitive plant have been regarded as so marvellous is that, up to the present time, they have been looked at as something entirely exceptional, whereas they are only the highest degree of development of a phenomenon, the traces of which we can follow throughout the entire vegetable kingdom."

[1] For a similar statement see Jussieu: Elements of Botany (English translation, 1849) p.503.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VII.] New York, September, 1880. **[No. 9.**

§ 71. **Proceedings of the Torrey Club.**—The regular monthly meeting of the Club was held at the New York College of Pharmacy, Tuesday evening, Aug. 10th. In the absence of the presiding officers, Dr. J. W. Barstow occupied the chair. There were fifteen members present.

Plants Exhibited.—Dr. Barstow exhibited a specimen of *Sarcodes sanguinea*, Torr., from California. Mr. A. Brown exhibited a large number of interesting adventive plants gathered in Eighth Avenue, near the Harlem River. Among these was *Galeopsis Ladanum* L., var., *angustifolium*, which he stated was growing there in great abundance. Mr. Bicknell displayed a large specimen of *Boletus felleus*, Fr., from Riverdale; specimens of *Typha latifolia*, L., showing fission of the spike; and a specimen of *Cyperus ovularis*, Torr., in which one of the upper leaves had at an early stage been split at its base, and in this aperture had grown a sessile spike of flowers. From the base of the spike sprang another leaf whose apex had grown through a small cleft in the larger leaf, thus enclosing the spike firmly in a sort of net-work. Specimens of *Aspidium Goldianum*, Hook., from White Plains were shown by Mr. O. R. Willis.

Adventive Plants, and New Stations.—Mr. Brown stated that he had recently detected *Paspalum distichum*, L., at Communipaw, N. J., and that *Potentilla fruticosa*, L., had been found by him this season at Tenafly, N. J. Tenafly was mentioned as a new station for *Hypericum adpressum*, Bart., the plant having been detected there this summer on the occasion of a field meeting.

Habenaria ciliaris, R. Br.—Attention was called to the fact that at a recent field meeting of the Club at Tenafly, this orchid was found there in great profusion—several acres of land being thickly dotted with its conspicuous orange-colored blossoms. According to observations made for several years past at this station by a few members of the Club, this species of *Habenaria* appears to flower only each alternate year.

Narthecium ossifragum, Huds. Mr. Leggett, during the course of some remarks on the results of a recent field meeting held at White Plains, stated that he had examined *in situ* the alleged *Narthecium* reported from that locality at the last meeting of the Club, and had positively determined from the leaves (the plant being no longer in flower) that it belonged to quite a different genus. Mr. Leggett's assertion was confirmed by an examination of dried specimens, which were exhibited to the Club later in the evening. The publication of the report before the reception of specimens was an oversight.

Dr. T. E. Wilcox, U. S. A., of Boise City, Idaho, was elected a corresponding member.

§ 72. **Ferns on the Cumberland.**—In the BULLETIN for June I reported the finding of *Adiantum Capillus-Veneris*, L., in Kentucky. I promised your readers then that I would probably visit the locality and give full particulars regarding the fern flora of this unexplored region.

The Cumberland River is a beautiful stream of clear water flowing through a very wild country and having high sandstone cliffs on each side. The mountains are well wooded. Hemlocks, oaks, chestnuts, birches, two magnolias and the tulip tree predominating; vacciniums, laurels and rhododendrons forming the undergrowth. The river opposite our tent was about 200 rods wide, but very shallow; it narrows somewhat, nearer the falls. Here the river is precipitated over the conglomerate table-rock with a vertical fall of sixty-three feet. The scenery below the falls is very grand. Sailing down in a boat one sometimes gets under some great overhanging ledge whose brow is richly clothed with *Polypodium vulgare.*

My first ramble was over the hills below the falls. I had not proceeded far when I found a few plants of *Lygodium palmatum*, an old favorite that I first met with a few years ago in Rockcastle Co., Ky. Tramping carelessly along, the climbing beauty seemed to haunt me; if I looked up, there it was hanging in heavy tresses from the cliffs above, away out of reach; if I looked under my feet, there it was ready to entangle me in its mazy web; move in any direction, it would stare me in the face, seeming to say—"You need not pass laws for my protection, you will never uproot me from my mountain retreat." I wondered sometimes whether the Virginia creeper or this beautiful fern would have the mastery. One bench of rock projecting out from two perpendicular cliffs, was just one mass of *Lygodium;* it was impossible to separate the plants, they were so twined and twisted and matted together.

I journeyed on, looking out for other rarities. *Asplenium pinnatifidum*, *A. Trichomanes*, *A. ebeneum* and *A. montanum* were found quite plentiful. Here, towards the top of the range, there are a great many precipitous rocks, which are tunneled out at the base, forming dark and damp recesses In some of these places I expected to find *Trichomanes radicans*. I had not searched very far when my toil was rewarded. There it was, growing in the greatest profusion, seeming to fancy the corner darkest and furthest from the light. With difficulty I removed the roots from the rock. There was little or no soil, but the roots seemed to have become part of the rock itself. This translucent beauty has evidently no desire to be removed from its secret hiding place. I also found the more common forms of ferns quite plentiful. My further walks added very little of interest. I delighted to observe the *Lygodium* growing in such profusion, and found a few plants of *Pellaea atropurpurea* growing on a sandstone cliff. This to me was of some interest, as heretofore I have always found this plant associated with limestone.

About fifty feet from this rock, I was fortunate in finding three or four plants of the *Adiantum Capillus-Veneris*, but they were very sickly-looking, and not over four inches in length. This, however, satisfied me that the fern was in the neighborhood and made me resume my search. The locality already reported for this fern was forty miles away; but, from seeing these few plants, I made sure I should succeed in finding it here in greater profusion. I was disappointed. I searched everywhere, into every crevice and every likely place. Occasionaly I would come across an overhanging ledge, and find my old friend, the *Trichomanes*, but no Venus-hair. After a week's diligent search, I abandoned the field and repaired to Point Burnside.

Point Burnside is a station on the Cincinnati Southern R. R., at the head of the navigable waters of the Cumberland River. The south fork of the Cumberland joins the main river at this point. The river is not so wide as at Cumberland Falls, but much deeper. I found I had got into a very different geological region from that at the Falls. The bed of the river and the range of cliffs on each side were limestone, but the high ranges were all capped with sandstone. On the lower cliffs I found in great abundance, beautiful specimens of *Pellaea atropurpurea*, and, to my surprise and delight, *Asplenium parvulum;* but I was anxious to visit the cascade, the reputed home of the maidenhair.

Getting into a canoe or dug-out, and with the assistance of a guide, I paddled down stream, about half a mile. I got out and walked towards the water-fall, and in a moment was perfectly entranced. I wondered if it was a dream or a reality. Could it be possible that this lovely fern should be growing in such great profusion. Yes, there it was, having probably been growing for thousands of years, unheard of and unsung. Imagine a hill side torn asunder by some unknown force, forming precipitous crags and deep cave-like recesses, with huge masses of rocks lying at the base, and numerous streams of the clearest cold water, rushing in every direction, and all overgrown with mosses, liverworts, maidenhair and the bulbous bladder-fern. Every rock, every crevice, was just one great mass of *Adiantum*. In the dark hollows, where the sun seldom penetrated, the fronds were thin and delicate, with leaflets broad and fringed like those of *A. Farleyense* of the greenhouses. The main cascade is about eighty feet high, and over it was pouring quite a stream of water. The rim or border of this cliff was a mass of fern fronds, some about 30 inches in length from the rootstock, hanging down away out of reach of the destroyer, if he should ever find this place. With some difficulty I ascended the top of the hill, as I wanted to see where all the water was coming from. The highest point is about three hundred feet above the river bed. A little from the top my guide showed me a cave out of which the water was flowing. The mouth of this cave measured about twelve feet in width, forming an arch of about six feet at the highest point. At the present time the water was making a pretty swift stream. The ground is somewhat flattish a little above the cascade, causing the water to distribute itself in different directions before falling, thus making the beautiful series of falls, as one looks up from below. The *Adiantum* is growing in great profusion from the cave mouth down to the base of the cliff, and immense bunches of it are found on the flattish plateau immediately above the fall. In fact, it is growing in every spot where this cave water reaches it. The whole rock is encrusted with a thick coat of carbonate of lime, and the cave is a beautiful illustration of cave formation. When a freshet or rain storm is in progress in the far-off mountains this stream is sure to be affected. Residents say that the water comes out with such force sometimes that one can hear it for miles. This then to me is the secret of the whole thing. The mountain has been burst asunder by the continued force of water. The *Adiantum Capillus-Veneris* has certainly an affinity for this geological formation. The carbonate of lime and the water is its very life. There it grows, in its own selected home, as it never grew before ; and it is to be hoped no hand of vandalism will ever destroy it. This scene is now a perfect gem of Nature's handiwork, in every sense.

I impressed Major Wallace, a gentleman who has some influence in this quarter, with the importance of having this spot protected. Next year there will be a great rush of visitors to this place, and, without some restriction, they will soon uproot every frond. The fern is found plentiful about two miles further up the river ; and those desiring specimens can get them there. I may state I found this fern only in places surrounded by such conditions as have already been mentioned.

Louisville, Ky., Aug. 18. JOHN WILLIAMSON.

§ 73. **Asplenium ebenoides,** R. R. Scott, in **New York State.**—I send, herewith, a frond of *Asplenium ebenoides*, R. R. Scott, which I found yesterday (Aug. 6th), on limestone rocks about four miles S. E. of Poughkeepsie. There were but three plants, and I secured but three fronds. I will give the locality a more thorough looking over, later on, and hope to find some more. *Asplenium ebeneum*, Ait., and *Camptosorus* were, as usually the case, growing with it—all three within a space of about a foot square. In these plants the veins anastomose quite frequently—about 24 times in the frond that I have. Prof. Eaton describes the venation in his specimens as everywhere free. I have never seen this fern mentioned as having been found in New York before; but, whether it has, or has not been, it certainly is very scarce, and worthy of being recorded in the BULLETIN.

Poughkeepsie, N. Y. CLARENCE LOWN.

§ 74. **Fendler's Trinidad Ferns.**—The sets of the second, or supplementary distribution, of this fine collection are now at Prof. Eaton's Herbarium. Several sets (including the first distribution) are still unsold.

§ 75. **Dr. Garber's Porto Rico Plants** are also for sale by Prof. Eaton. The sets run from 96 to 17 species, and are mostly interesting plants. That most delicate of all ferns, *Trichomanes trichoideum*, is in all the sets.

§ 76. **Notes from Syracuse.**—*Plantago media*, L., has been found in the streets. It resembles *P. major*, but has soft downy leaves, and shorter petioles which are not grooved ; the spikes of flowers are shorter, but the stamens are longer and brilliantly colored. Muhlenberg found it in Pennsylvania (Cat. 1813), but Dr. Gray says it is not known there in our days.—Mr. L. M. Underwood has found *Zygadenus glaucus*, Nutt., growing in considerable abundance in "Tamarack Swamp," two miles east of Syracuse. He would be glad to furnish specimens of this rare plant in exchange for *Orchidaceae*. —The Syracuse Club has gathered *Epipactis* again this year.

§ 77. **Notes from California.**—As in my occasional botanizing, I sometimes am able to make an observation new and interesting to myself, and, so far as I can learn, not yet recorded, I accept your general invitation to "communicate," and send you the following items:

Double Flowers: While botanizing at Whitewater, Wis., in the spring of 1876, I found quite frequent specimens of *Thalictrum anemonoides* and *Hepatica acutiloba* with double the normal number of sepals; and in some cases, I thought I could detect indications of two circles of floral parts, as if two flowers had a common torus A few weeks ago, while botanizing here, on the mountains, I found a specimen of *Lilium rubescens* on which was one well-defined twin flower, with ten parts to the perianth, twelve stamens, and *two pistils*, proving beyond doubt the twin character of the blossoms.

Rootstock of Erythronium grandiflorum.—While collecting the above plant on the foot-hills here, I discovered that it has a very delicately attached rootstock.

Lilium Humboldtii.—This plant, which is very abundant along mountain streams here, frequently has one of its upper whorls of leaves lengthened into a very perfect spiral.

Pontederia cordata.—This plant I find growing under cultivation here; the owner says he collected it in this county, but I have not seen it wild. I observe that as the flowers wither, the stems bend downward until the fruiting spike is immersed in the water, where the fruit matures. I observed the same fact concerning it in Wisconsin.

Ricinus communis.—The castor-oil plant, which is an annual herb in the Northern U. S., grows to be a perennial tree twenty feet high in Southern California.

Poison Oak.—The poison oak of California, *Rhus diversiloba* (?) grows very abundantly everywhere on the foot-hills and mountain sides. Though quite as poisonous in its effects upon human beings as *Rhus toxicodendron*, the horses and cattle here eat it with relish and apparently without harm. GEO. R. KLEEBERGER.

Weaverville, Cal., July 27.

§ 78. Teratological Notes.

1.—In the Horace Mann herbarium at Cornell University is a specimen of *Botrychium lunarioides* which, besides possessing the usual fruiting stalks, has two of the sterile segments replaced by fertile divisions.

Dichotomous fronds of *Aspidium marginale* have several times been found by me at Ithaca.

In 1879 I collected a "twin frond" of *Polypodium incanum* in Alabama. The stipe branched near the middle.

Supernumerary carpels were frequently observed on *Acer Pseudo-Platanus* at Ithaca, the number of wings sometimes reaching five.

Last spring I found a regular, spurless flower of *Viola cucullata* with revolute petals; and flowers of *V. rostrata* with several spurs were several times found. WM. TRELEASE.

2.—Adventitious leaves on *Rhus glabra*, L., are of common occurrence hereabouts, and this season more than usual; also occasionally on *Rhus copallina*, L. I have not observed them on any other species.*

Anthoxanthum odoratum, L. is common with adventitious leaves in summer.

Many plants have made a remarkable variation in their second, or last growth, such as twin and branching or forking stems, etc. A plant of *Corallorhiza odontorhiza*, Nutt., threw up three scapes from one root. But the most remarkable behavior is the change in the flowers of *Gratiola aurea*, Muhl., some being very double, others having one flower set in another like a *Primula*. In some cases one or two buds would grow out of a flower. I enclose a few specimens I have at hand, not the most double. Thousands of them are found on the edge of a pond. ERASTUS S. WHEELER.

Berlin, Mass.

*[Mrs. Rust, of Syracuse, sends specimens of *Rhus typhina*, L., in which the flowers are replaced by leaves. EDS.]

3.—*Monstrous Fuchsia.*—We have received from Mr. James H. Cook, of Strathroy, Canada, a fresh specimen, accompanied by an excellent pencil sketch of a monstrous *Fuchsia*, which shows the following changes: From the side of the ovary, near its base, there proceeds a perfect leaf; the ovary is normal, but the calyx limb is five-lobed, and there are but two petals. The stamens are eight in number; one of them confluent with the margin of a petal, and another having a decidedly petaloid anther. The flattened pistil is coherent with the inner surface of the calyx tube throughout the whole length of the latter, and its exposed portion is provided with a narrow, finely-serrated lamina which extends as far as the five stigmas.

§ 79. **Pine Barren Plants in Rhode Island.**—I was much interested in Mr. Britton's article in the July number, on the Northward Extension of the New Jersey Pine Barrens Flora. We have a little piece of that peculiar region in Southern Rhode Island. In his list I check the following as certainly occurring with us: *Hudsonia ericoides*, L., very abundant; *Tephrosia Virginiana*, Pers., frequent; *Aster nemoralis*, Ait.; **A. concolor*, L; *Chrysopsis falcata*, Ell., abundant; *Gaylussacia dumosa*, T. & Gr.; *Kalmia angustifolia*, L.; *Asclepias obtusifolia*, Michx.; *Spiranthes simplex*, Gray; *Xyris flexuosa*, Muhl.; *X. Caroliniana*, Walt.; *Glyceria obtusa*, Trin.; *Coreopsis rosea*, Nutt., this year superabundant; *Eupatorium hyssopifolium*, L.; *Aster spectabilis*, Ait.; *Solidago puberula*, Nutt.; *Cupressus thyoides*, L.; *Sporobolus serotinus*, Gray; and *Lycopodium inundatum*, L. I could add many peculiar southern forms, like *Lachnanthes*, long ago found by Dr. Thurber and my father at Worden's Pond. I commend that locality, which is easily reached from Narragansett Pier or Watch Hill, to all collectors who come to the Plantations. W. W. Bailey.

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* *Aster Herveyi*, A. Gray, it will be remembered was also found within our limits last year by Prof. Sargent. W. W. B.

Providence, R. I., Sept. 10, 1880.

§ 80. **Botanical News.**—The *Botanisches Centralblatt* is the title of a new weekly journal published under the editorship of Dr. O. Uhlworm, of Leipzig. The object of the publication is to supply brief abstracts in each issue of every important new independent paper in a scientific journal, in all branches of botanical science; a complete index to titles of recent botanical literature in all countries; brief original communications; reports of museums, gardens, botanical explorations, etc.; personal news, etc. Dr. Uhlworm has secured the co-operation of correspondents in the various towns of Germany, France, England, Switzerland, Sweden, Denmark, Greece, Russia, Holland, etc., and invites the further assistance of botanists in all countries to render the *Centralblatt* as complete and useful as possible. The Editor's address is Südstrasse, 82, Leipzig.

Trimen's *Journal of Botany* for July contains: Enumeratio Acanthacearum Herbarii Welwitschiani Angolensis, by S. LeM. Moore; Cardamine pratensis and its Segregates, by G. Nicholson; On Lattakia Tobacco, by W. T. Thiselton Dyer; Botany of the British Polar Expedition, by H. C. Hart; and On a Collection of Ferns made by Dr. Beccari in Sumatra, by J. G. Baker.

In the *Botanical Gazette* for July, Mr. Meehan discusses the vitality of pine seeds; Dr. Gray calls attention to the proterandry of *Eremurus robustus;* Prof W. W. Bailey records a case of albinism in *Arethusa bulbosa;* Mr. L. H. Bailey gives a short list of Michigan Lake shore-plants; and another writer notes the occurence of six fungi on *Anemone nemorosa*. The Editor of the *Gazette* announces his intention of closing his sanctum for two months, and of partaking of a luxury seldom accorded to journalists—that of a vacation.

Origin of Flowers through Insect Selection.—Not long since, Dr. Herman Müller, it will be remembered, published a work in which he endeavors to explain the existing variations in the forms of flowers on the principle of "selection." His supposition is that insects of different tastes breed peculiar flowers just as men breed peculiar races of cattle. Carrion-loving insects breed their kind of flowers; long-tongued insects the tubular kinds; and many other classes of insects have each bred the flowers they love best. Dr. Müller has a note in *Nature* of July 8th, in which he points out that the European *Saxifraga umbrosa* has been adorned with its present brilliant colors through selection by dipterous insects of the family Syrphidae. He says:

"Among Diptera the most assiduous visitors of flowers are certain Syrphidae, which, elegantly colored themselves, are fond of splendid flower-colors, and, before eating pollen or sucking nectar, like to stop awhile, hovering free in the air, in front of their favorites, apparently fascinated, or at least delighted, by the brilliancy of their colors. Thus I repeatedly observed *Syrphus balteatus* hovering before the flowers of *Verbascum nigrum*, and often before *Melanostoma mellina; Ascia podagrica* before *Veronica chamaedrys;* and in the Alps the lank *Sphegina clunipes* before *Saxifraga rotundifolia* and in my garden *Ascia podagrica* before *Saxifraga umbrosa.*

Of *Verbascum nigrum* the main fertilizers are humble-bees, Diptera co-operating only in a subordinate degree; in the case of the three other species, on the contrary, the above-named Syrphidae are such frequent visitors and cross-fertilizers that we may safely conclude that it is by their selection of elegantly-colored varieties that these flowers have acquired their beautiful peculiarity. Hence, in order to estimate the color-sense of these Syrphidae, it is worth while to consider what color-combinations they have been able to produce by their selection.

Saxifraga umbrosa being, as far as hitherto known, their finest masterpiece, we may in the first place look at the variegated decoration of this species. Its snow-white petals are adorned with colored spots, which in size and intensity of light gradually decrease from the base of the petals towards their extremity. Indeed, nearest to their base, within the first third of their length, there is a large irregular spot of an intense yellow; about the middle of their length there follows a narrower cross band of red color, vermilion towards the base, intensely pink towards the outside, not reaching the margins of the petals, sometimes dissolved into several separate spots; lastly, beyond the middle of the length of the petals there are three to eight smaller roundish spots of a paler violet-pink color.

The flowers of *Veronica chamaedrys* prove that also gay blue colors are perceived and selected by Ascia.

On some Impurities of Drinking-Water.—Under this title, Prof. W. G. Farlow has recently sent us a pamphlet recording the results of his investigations, extending over several years, as to the causes of the "pig-pen" odor which occasionally makes its appearance in water stored up for the use of cities. The subject is discussed in a popular form, and from strictly a botanical point of view. Prof. Farlow has traced the cause of the odor in question to the putrefaction of algae belonging to the order *Phycochromaceae.* This order contains certain genera, three at least of which have been found in decay to cause disagreeable conditions of drinking-water; these genera being *Clathrocystis*, *Caelosphaerium* and *Anabaena.* So far as known, the so-called "cucumber taste," which also sometimes makes its appearance in drinking-water, is not due to the growth or decay of any species of plant; nor can any cause—botanical, zoölogical, or chemical be assigned for it. A perusal of Prof. Farlow's paper will serve to allay the fear of those who see in every minute alga floating in water the germs of disease.

The August number of the *Phrenological Journal*, received July 20th, contains a portrait of the late Charles C. Frost, accompanied by a biographical sketch from materials furnished by Rev. Lucius Holmes.

To the *American Monthly Microscophical Journal* Dr. Wolle contributes another note on fresh-water algae; the subject treated is the genus *Bulbochaete*, and figures of six species illustrate the text.

§ 81. **Erratum.**—In Mr. Ellis's description of a new *Sphaeria*, p. 90, 6 lines from the bottom of the page, strike out the comma after the word "*sporidias.*" Although Mr. Ellis's communication is dated May 26th, it was not received by us till the latter part of July.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VII.] New York, October, 1880. **[No. 10.**

§ 82. **Proceedings of the Torrey Club.**—The regular meeting of the Club was held at the New York College of Pharmacy, Tuesday evening, Sept. 14th. In the absence of the presiding officers, Dr. T. F. Allen occupied the chair. There were sixteen members and three visitors in attendance.

Plants Exhibited.—Mr. Wright exhibited a number of dried plants from Mt. Riga, Conn., and distributed, on behalf of the sender (Mr. Wm. Chorlton), some specimens of exotic flowering plants and ferns. Mr. Britton distributed seeds of *Megarrhiza Californica* and *Nelumbium luteum*, Willd., and exhibited specimens of *Phoradendron flavescens*, Nutt., taken from *Nyssa* in the pine barrens of New Jersey. Mr. Brown showed a large number of specimens of adventive plants from Communipaw. Specimens of *Spiranthes simplex*, Gray, from Woodlawn Cemetery, and of *Silphium perfoliatum*, L., from Fort Washington, were shown by Mr. Bicknell. Mr. Le Roy stated that the last mentioned plant was introduced into the upper portion of New York Island many years ago by a gentleman who sowed the seeds broadcast in several localities. Mr. Gerard brought specimens of *Opuntia vulgaris*, L., from the King's Bridge Road (directly west of High Bridge), and of *O. Rafinesquii*, Englm., from Fort Washington, and pointed out the difference between the two species, which are often confounded. Prof. Martin exhibited and remarked upon specimens of carnauba wax—the product of the leaves of *Copernicia cerifera*, a Brazilian palm. Prof. Martin stated that his specimen was portion of a cargo of this product recently brought to New York, but which had met with no sale, the impossibility of bleaching it rendering it unfit for many purposes in the arts and industries.

Teratology.—Dr. Kunze brought for the Club's inspection a living specimen of *Cereus*, which had been received by him from Venezuela, and in which the upper joints were greatly deformed and closely coherent, forming a compact, nearly globular mass. The changed appearance of the plant was so great as to render identification of the species impossible. Mr. Wright exhibited a specimen of *Setaria viridis*, Beauv., showing fission of the axis and a consequent formation of two well-developed spikes at the apex of the same culm. Mr. Bicknell showed a fruit of *Quercus Prinus*, L., the cupule of which contained a supernumerary, although compressed and sterile acorn.

Large Trees.—Mr. Britton stated that during his recent exploration of the pine barrens while in the employ of the N. J. Geological Survey, he observed in Manahawken Swamp, Ocean Co., a *Magnolia glauca*, the trunk of which was 32.25 inches in circumference. This tree when felled was found, on counting the rings, to be about 150 years old. In the same swamp was found an *Ilex opaca* of unknown age, with a trunk 36 inches in circumference. Mr. Britton had seen in the museum of Rutger's College a section of the trunk of *Liriodendron* having a circumference of 21 feet. The specimen was obtained at Marlborough, N. J.

Vitality of Gourd Seeds.—A remarkable case of duration of vitality in the seeds of a cucurbit was mentioned by Mr. Le Roy. In the Torrey collection there is a specimen of a gourd which was obtained between the years 1838 and 1842, in Patagonia, by the Wilkes Exploring Expedition. Finding three seeds still remaining in the specimen, Mr. Leroy planted them in his garden. Two of the seeds germinated, and the plants are now in fruit. For want of the necessary figures and descriptions, the species has not yet been identified.

Dr. T. F. Allen read a paper on the "Similarity between the *Characeae* of America and those of Asia."

§ 83. **Polyporus volvatus,** Peck, **and its Varieties.**—Since the publication of the description of this fungus in the Twenty-seventh New York State Museum Report, other forms of the species have come to my knowledge, and other observations have been made which render some additional notice of it desirable, since it presents two characters which may perhaps be deemed of more than mere specific value. The most conspicuous one is the remarkable prolongation of the margin of the pileus. This extends beyond and beneath the mouths of the pores like a thick coriaceous veil, and either wholly or partly conceals them from view. In two of the varieties* the veil opens below by a well defined circular or subelliptical aperture, usually about one-fourth of an inch in diameter. Through this aperture the spores have a way of escape, although it is so much smaller than the hymenial surface that it is not unusual to find little heaps or even masses of spores retained within the veil. These heaps of spores are generally permeated by minute filaments which apparently aid in holding the spores together. The aperture is not exactly in the centre of the veil, but nearer the posterior than the anterior surface of the fungus. The veil is a little thicker just anterior to the aperture than it is elsewhere. The thin epidermis generally disappears from the veil, so that in mature specimens this part is often a little paler than the rest. If this is cut away the remaining part of the pileus is nearly hemispherical. The hymenophore or non-porous part of the pileus, in fresh specimens, is separable into two parts. The exterior, which, by its continuation beyond the mouths of the pores, forms the veil, may be torn away from the thin interior part which lies next to and is intimately connected with the pores, very much as the rind of an orange may be peeled from the pulp. The thin interior stratum is also slightly prolonged beyond the mouths of the pores and its prolongation forms a kind of prominent margin to the hymenial surface. The other character is found at the mouths of the pores. Not only are the dissepiments here differently colored, but they are also decidedly and permanently thicker than they are elsewhere, thus making the diameter of the pore much less at the mouth than it is a little distance above. The hymenial surface appears very much as if it had been thinly overspread by some colored, yielding but inelastic substance, and then punctured by the point of a pin just over each pore. The prominence of the interspaces causes the pores to appear as if in little depressions. Are the characters now noticed of generic value? Possibly some may so regard them; and, certainly, genera of fungi have been constituted upon far less obvious characters than these; but until other species are known which shall give emphasis to the importance of these characters it seems best to me to consider them merely sectional or at most subgeneric. Without them the species would naturally fall in the Suberose section of the *Placodermei.* In this section is the birch *Polyporus*, (*P. betulinus*,) a species in which also the margin of the pileus extends beyond the mouths of the pores, but to a far less extent. It never even partially conceals them from view. In this species also, the pores and a very thin layer of the hymenophore to which they are attached are separable in the fresh plant from the main part of the pileus. Thus it makes an approach to the aberrant characters of *P. volvatus;* slight, indeed, but sufficient to indicate the relationship of the latter to more typical *Polypori* and to cast a doubt upon the generic value of the characters indicated. That the mouths of the pores should present a color unlike the rest might not, of itself, be considered a very important or novel feature, but the permanent thickening of the dissepiments at this place and the consequent diminution here of the diameter of the pores is a character not clearly shown by any other *Polyporus* known to me. It may, therefore, be well to make at least another section of the *Placodermei* for the reception of this fungus.

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* In the variety *Torreyi* no aperture has yet been seen, but one probably exists in fully and properly developed specimens.

The typical form of the species has been found on dead trunks of the black spruce, *Abies nigra.* It occurs on these plentifully in some parts of the Adirondack forests of New York, where it follows the devastating track of the spruce-destroying beetle. Dozens of specimens may be found on the trunk of a single tree, and generally each specimen covers a perforation previously made in the bark of the tree by the attacking beetle. The mycelium grows beneath the bark and the perforations afford a convenient passage-way to the external air where the fungus is developed. Any crevice in the bark, however, will answer the same purpose, so that the fungus is not dependent on the perforations of the beetle for its full development and the continuance of its species. The average size of the specimens is from one-half to three-fourths of an inch in diameter. Rarely do they exceed one inch in diameter. The color of the mouths of the pores is a pale cinnamon-brown.

A second form has been collected in California by H. W. Harkness, M.D., who finds it on the twisted pine, *Pinus contorta*, and on one or two other coniferous trees. A single specimen was once found by the writer. It grew on pitch pine, *Pinus rigida*, near Albany, New York. This form is generally larger than the other, its average diameter being about one inch. The mouths of the pores are also generally darker colored. Specimens of it were sent to England and there received the name *Polyporus obvolutus* Berk. and Cke., (*Grev-*

illea, Vol. vii. p. 1.) but no description was published with the name. It can not well be considered a distinct species, as the differences between it and the other form are only those of size and color. Specimens of it have been distributed by Mr. J. B. Ellis in Century IV, North American Fungi. A third and more distinct form comes also from California. For my information concerning it I am indebted to Mr. W. R. Gerard who informs me that the herbarium of the late Dr. Torrey contained three specimens (all that are known) which bore the record—" In Sandy Desert, California." All had a distinct lateral stem, as shown in the annexed figure, and, in all, the veil-like prolongation of the margin of the pileus was entirely closed. Nevertheless the spores were well developed and the mouths of the pores had the dark-brown color that exists in the other Californian specimens. No record was found concerning the matrix on which the specimens grew, but Mr. Gerard suggests that it was probably some small twig, judging from the appearance of the base of the stem. The size of the pileus was about the same as in the other Californian specimens.

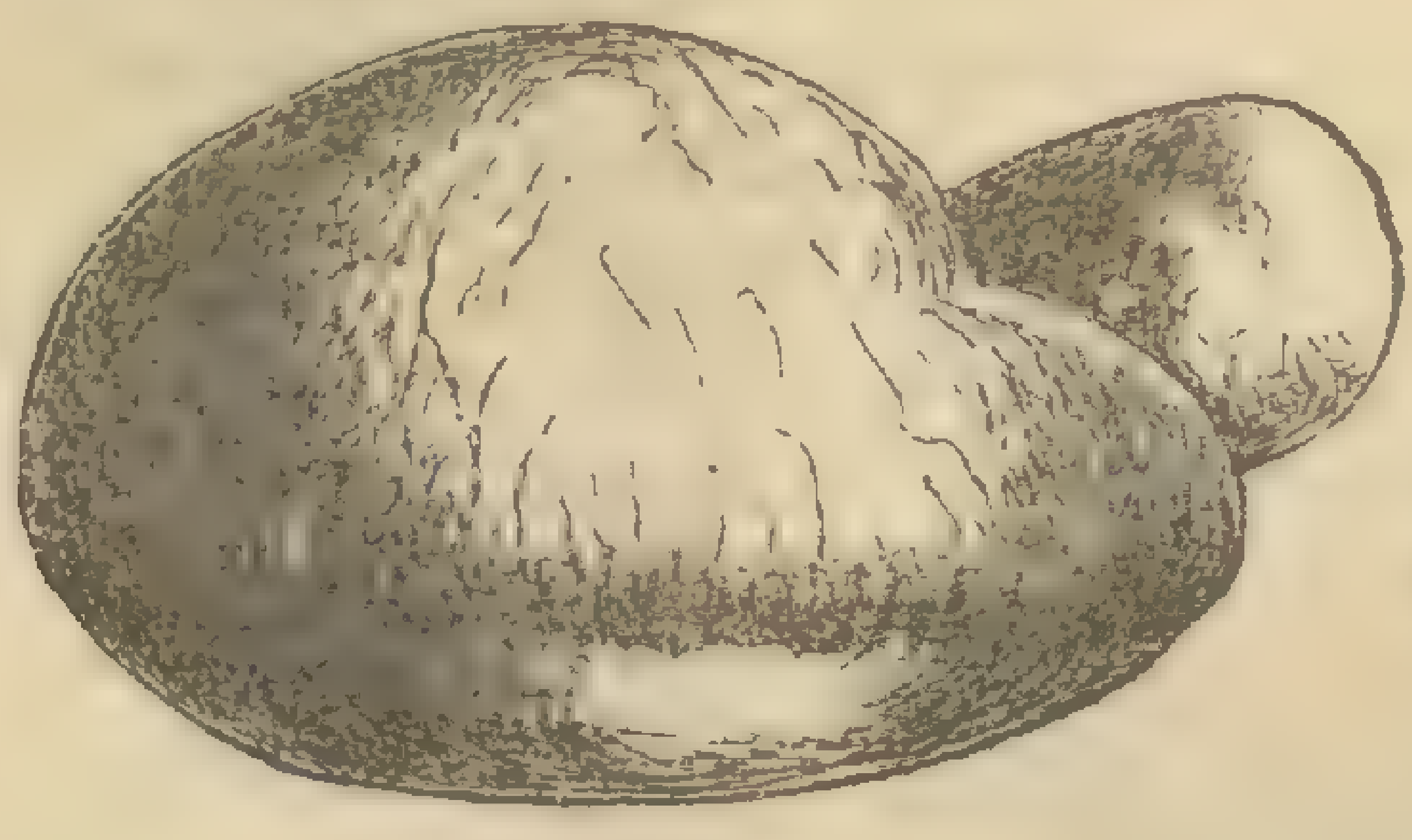

Fig. 1.

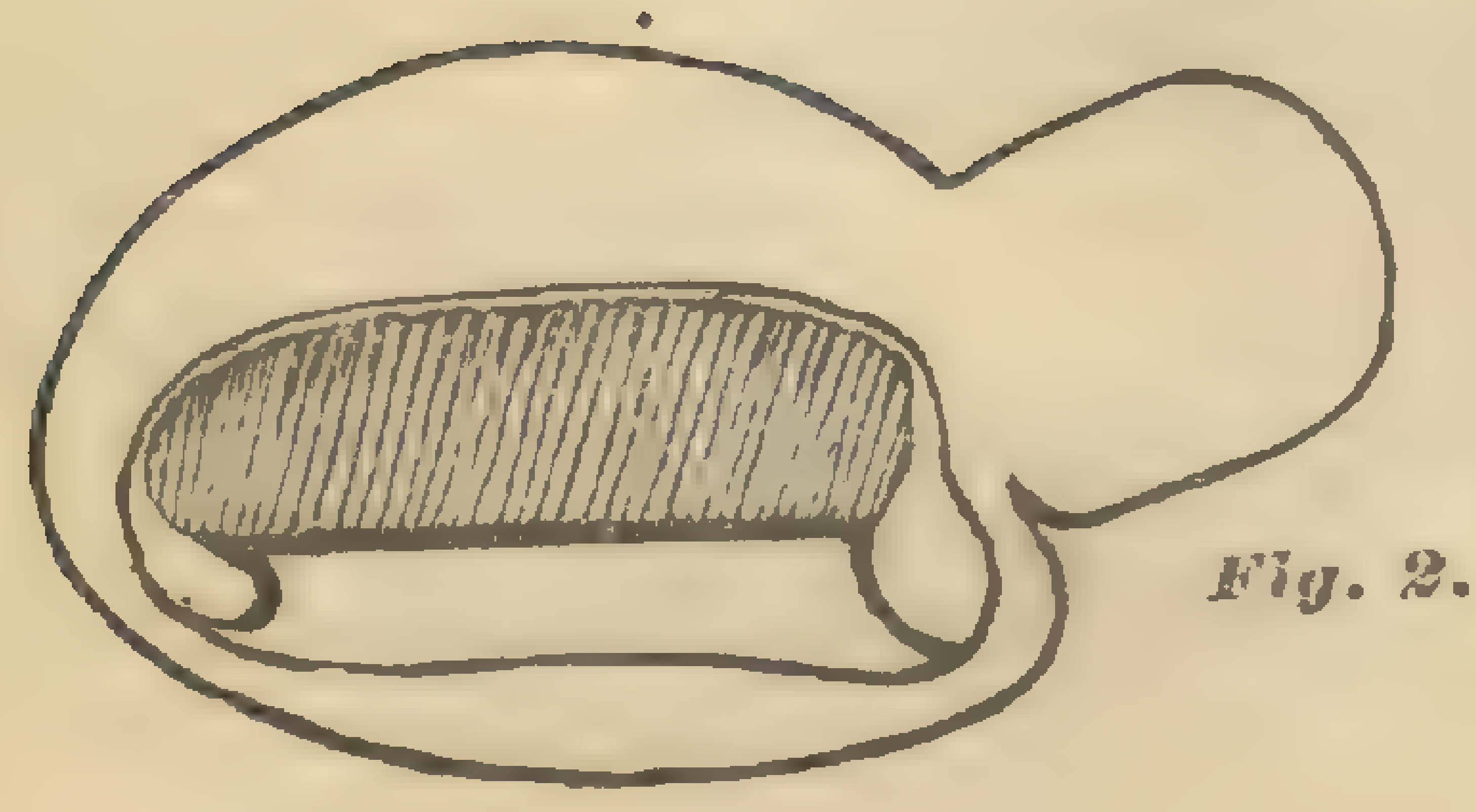

Fig. 2.

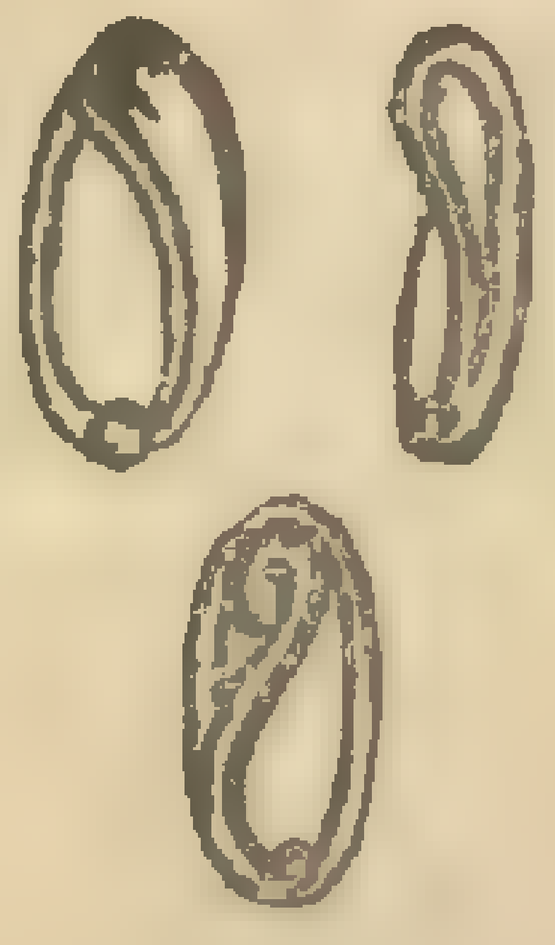

Fig. 3.

The following is a brief characterization of the section, species and varieties of this fungus.

CRYPTOPORUS.

(A section of *Placodermei.*) Pileus at first subcarnose, becoming harder or corky, sessile or stipitate, the margin greatly prolonged beyond and beneath the mouths of the pores and wholly or partly concealing them from view, generally opening beneath by a small aperture; pores not stratose, the dissepiments thickened at the mouths and there differently colored.

The only species yet known is

POLYPORUS VOLVATUS, Peck.

Pileus globose or subglobose, sessile or rarely stipitate, even, glabrous, azonate, whitish, often somewhat tinged with yellowish or reddish-brown; pores equal to or longer than the thickness of the hymenophore, the mouths punctiform, light cinnamon-brown or dark-brown; spores pale, with a flesh-colored tint, .00035–.0005 of an inch long, about .0002 of an inch broad.

Var. *typicus*. Smaller, 6–9 lines in diameter, sessile, mouths of the pores light cinnamon-brown. On *Abies nigra*. New York.

Var. *obvolutus*. (*Polyporus obvolutus*, Berk. & Cke.) Larger, 10–15 lines in diameter, sessile, mouths of the pores usually dark-brown. On *Pinus contorta*, etc., California. On *Pinus rigida*. New York.

Var. *Torreyi*, Gerard, *Ms*. Larger, 10–15 lines in diameter, stipitate, mouths of the pores dark-brown. California, (*Legit* John Torrey, M.D.)

CHARLES H. PECK.

EXPLANATION OF THE FIGURES.—Fig. 1, the stipitate variety *Torreyi*, of *Polyporus volvatus*, Pk., natural size. Fig. 2, vertical section of the same. Fig. 3, spores x 1000, seen in three positions.

§ 84. **Sexuality of Croton monanthogynum.**—In 1878 I collected a few seeds of *Croton monanthogynum*, which were sown in the spring of 1879. These germinated in the spring of 1880, and are now in flower. There are four plants. Two are wholly pistillate, and two wholly staminate. So far as these four plants go, it would seem that the species is dioecious and not monoecious as described in our references.

It is interesting to note that these male plants are not half the size of the females, and this accords with similar facts in hemp, spinage and others; and with the general views explained in my Salem and Troy papers (American Association for the Advancement of Science) that a greater vital (nutritive) power is associated with the production of female than of male flowers. It is not always, however, that the lower power of nutrition is evidenced throughout the whole plant as illustrated in these instances. Often it is only on the weaker branches of the same plant that the male flowers are borne—the ones the most highly vitalized resulting in female flowers.

THOMAS MEEHAN.

§ 85. **Similarity between the Characeae of America and Asia.**—Prof. Asa Gray has well shown the similarity of the floras of the eastern parts of the two great continents in relation to other groups of plants, and I now propose to show that this resemblance extends to the *Characeae*, although as yet our acquaintance with the forms of this order, both Asiatic and American, is comparatively slight.

My knowledge of Eastern *Characeae* is obtained wholly from some articles by the late Prof. A. Braun, in *Linnaea*, Vol. 17, Ser. i. *Charae Preissianae*, and in Vol. 1 of *Hooker's Journ. of Botany*, 1847, *Characeae Indiae Orientalis etinsularum Maris Pacifici*. The former article treats of the Australian species; the latter of those of India, Ceylon, the Sunda, Mariana and Sandwich Islands, and is of the greater interest to us. In his preface Prof. Braun says: "It is remarkable that several of the East Indian species agree with those of South America and the warmer parts of North America."

The first species to which I desire to call attention is

NITELLA POLYGLOCHIN, A. Br.—This name was proposed by the late Prof. Braun in his *Characeae* of Africa, to include *N. Roxburghii*, A. Br., *Hooker's Journ.*, 1, 292, *Chara furcata*, Roxb., *C. soluta* and *Lysimocepas Voigtii*, Griffith's posth. papers. It is the type of a series of forms which belong to the *Diarthrae-monoicae* division of the genus *Nitella*. The species of this large division possess two-celled terminals and are divided into two series—the *Mucronata* with single tips and the *Polyglochin* with multiple tips, (the Greek words from which it is derived signifying many points). *Nitella Roxburghii*, of the coast of Coromandel near Madras, answers perfectly to the specimens that I have found in this country. The plant is not known in Europe, neither is there any representative there of this *Polyglochin* series. Nothing can exceed the superb beauty of masses of this *Nitella* as brought up from deep water in Litchfield Lake, Conn., where it grows along with the roots of *Marsilia quadrifolia*, L. The antheridia are not red as in most *Characeae* but a very delicate green, with a shade of old gold; and one afternoon when I captured a mass half the size of my boat while the setting sun shone across it as it lay just beneath the surface, my enthusiasm was unbounded. It there grows from two to four or, I believe, even six feet in length. I have also gathered it in New Jersey, and have received it from the West and from Boxford, Mass., by the kindness of Mr. John Robinson, of Salem. Twenty years ago, when I sent the small-fruited variety to Prof. Braun, it was then considered distinct (*N. microcarpa* A. Br., *Characeae* of Central America). These two forms of the *Polyglochin* series differ from other allied species by their *clustered fruit;* I often find four or five sporangia in one verticil, reminding me of the *Tolypellae*. They seem to be widely distributed over the American continent.

CHARA HYDROPITYS, Reichenb. This species belongs to the *Haplostephanae*, *Bistipulatae*, *Diplostichae Monoicae* division of the genus *Chara*. The name was first bestowed on specimens from Surinam. In 1830 Salzmann gave the name *C. longibracteata* to some specimens from Brazil, and Prof. Braun in his *Characeae* of Central America gives Dutch Guiana, Brazil, Mexico, the South-Sea Islands, VanDieman's Land, Australia, Southern Africa, and the East Indies as habitats for it. In *Hooker's Journ.*, 1, 297, 1847, it is reported from the coast of Coromandel, Assam, and Busna in India. It is a beautiful microscopic object; the leaves are either entirely naked or have two or three corticated nodes. The finest specimens are found in New Jersey, where it is abundant (Panther Pond, Sussex Co., and Morris Pond, Sparta). I have also gathered it in Apponaug Pond, Rhode Island. I have received the naked-leaved form (*Chara Chamaepitys*, A. Br.) or a variety nearly allied to it, from Florida (Curtiss). It is thus apparent that the species is widely diffused in this country; but no plant of this division is known in Europe. I have also a dioecious *Chara* of the same section, either a variety of *C. Dichopitys* or a closely allied new species, which was sent me by Mr. Curtiss from Key West. The fruit is much larger than in *C. Hook-*

eri, A. Br., and *C. Preissii*, A. Br., (both of which Prof. Braun includes under C. *Dichopitys*), and more closely approaches that of *C. Ecklonii* from Africa. Should this prove distinct, I propose to name it *C. Curtissii.*

All of these *Charae* are always gymnopodous, that is the first internode of the leaf is naked. The variations in the cortication of the other internodes are great; this naked internode is usually quite as long as any of the others, thus differing from the *Gymnopodae* of the *Diplostephanae* section. The development of the stipules serves to distinguish one from the other; besides, the stem cortication of the latter plants is *triplostichous* while that of the former is *diplostichous.*

These *Gymnopodae* of the *Diplostephanae* section of the genus *Chara* are also peculiar to America as compared with Europe, and common to America and Asia. Not a single species is known in Europe; while in America, North and South, the islands of the Pacific, Asia and Africa, there are numerous species and varieties. In the United States we find *C. sejuncta*, A. Br., two varieties; *C. gymnopus* var. *elegans*, A. Br.; var. *Humboldtii*, A. Br.; var. *trichacantha*, A. Br.; var. *Michauxii*, A. Br.; var. *conjugens*, A. Br. In the Sandwich Islands, var. *Meyenii.* In India, var. *Ceylonica.* In Africa, var. *Delilei.* In some of the West India Islands, var. *Berteroi*, besides the following allied species: *C. Javanica*, A. Br., *C. inconstans*, A. Br. Central America; *C. Crügeriana* A. Br., Trinidad; *C. Angolensis*, A. Br., and *C. Commersonii*, A. Br., Africa. It is interesting to note that this species, with its sub-species and varieties, is widely known except in Europe.

For the determination of other forms we find ourselves obliged to consult the East.

T. F. ALLEN.

§ 86. **Large Trees near New York City.**—The following trees of considerable size were measured during the month of July. The circumferences are nothing extraordinary for the respective species in their most favored localities, but are perhaps as great as any to be found in this neighborhood. In the town of Bayonne, Hudson Co., N. J., on the New Bergen Road, just south of the M. & E. Canal bridge, there is a remarkable group of *Castanea vesca*, L., var. *Americana*, Michx., one 16 feet, two over 12 feet, and seven over 10 feet in circumference at 5 feet from the ground. They have been almost entirely deprived of their bark, and all are dead or dying; but the trunks show no signs of decay.

Populus monilifera, Ait. A beautiful tree, 14 feet in circumference, measured at 5 feet from the ground, adorns the lawn of Philip S. Crook, Jr., at the corner of Flatbush and Caton Avenues, in the village of Flatbush, Kings Co., N. Y. Some years since it was struck by lightning, but shows little sign of injury. The owner, being a gentleman of taste, saved the tree by the application of a great metal band around the base of the lower limbs.

Juglans nigra, L. A specimen 12 feet in circumference, on Mr. Crook's lawn, makes a worthy fellow of the *Populus.* In the forks of its branches, at 20 feet from the ground, there has sprung up a bush of *Ribes rubrum.*

Quercus alba, L. In a wood on the south side of the Astoria and Flushing Road, near the school house, a quarter of a mile east of the Trains' Meadow Road, in the town of Newtown, Queens Co., N. Y., the following trees were measured: two of 9 feet each in circumference, at 5 feet from the ground; one of 11 feet 9 inches; one of 9 feet 7 inches; one of 12 feet 3 inches; one of 10 feet 6 inches; and one of 13 feet; the last with a spread of 85 feet. The wood of which the above forms a part has recently had much timber cut in it, and there is little doubt that these fine trees will soon fall before the axe.

Liriodendron Tulipifera, L. A few trees from 10 to 12 feet in circumference still remain on Bergen Neck, near the M. & E. Canal. Before the establishment of a saw mill on the side of the canal, there was a great variety of splendid forest trees in the Pamrapo woods.

Platanus occidentalis, L. This seems to have been a favorite shade tree in the olden time. In Brooklyn the course of the primitive country roads, long since closed, may be traced by their frequent occurrence, often in pairs, as they stood in front of the farm houses. A pair in front of 121, McDonough Street, measure respectively 14 feet, and 14 feet 8 inches in circumference. Another pair still flourish on the Jamaica plank road, in New Brooklyn. They are 10 and 11 feet in circumference. A single tree in front of 684, Atlantic Avenue, measures 11 feet.

The almost entire absence of large forest trees, which is very noticeable on Long Island, is accounted for by Stiles, in his History of the City of Brooklyn, (Vol. 1, page 310), as follows: "In the fall of every year the Long Island counties would be assessed for many thousand cords of wood, to be cut down and delivered at certain points for the use of the British garrisons in New York and vicinity. In this manner both Queens and Kings Counties were utterly despoiled of the abundant forests which had been their pride; and when the British finally left the island, scarcely a stick, except a small piece of oak woods a few miles beyond Jamaica, which belonged to a strong Tory, had escaped the axe. All the woodlands now in these counties have grown since the year 1783."

Either the above statement is too broad, or the locality "beyond Jamaica" is a mistake. The Newtown oaks mentioned above are certainly older than 1783. The oaks of the same species in Flushing, under which George Fox preached in 1672, and which were then presumably large trees, when measured by Messrs. Bruce and G. Furman 153 years afterwards, were but 13 feet and 12 feet 4 inches in circumference, or about the size of the two largest Newtown oaks. (Furman's Antiq. of L. I., 1875, page 97).

The annals of Newtown and of Queens Co. fail to throw any light on the exact locality of the oak woods, which Dr. Stiles states were spared during the Revolution.

Brooklyn, July 30, 1880. W. H. RUDKIN.

§ 87. **Contributions toward a List of the State and Local Floras of the United States.**—It is proposed in this and subsequent numbers of the BULLETIN to enumerate, as far as known to us, all the

State and local floras that have thus far been published. Large numbers of short lists of plants of various localities have appeared from time to time in the BULLETIN, the *Botanical Gazette*, and in numerous scientific publications not devoted especially to botany; but only the more important and longer lists from such sources are referred to in the following catalogue. As the subject covers a wide field we cannot hope, unaided, to elaborate it perfectly; and it will doubtless be found that we have overlooked many publications of importance. We would esteem it a favor, therefore, if those who notice such omissions would kindly call our attention to them, in order that the omitted titles may be published as an appendix and the record thereby be eventually rendered as complete as possible. In the following catalogue, bare lists of plants without stations are denoted by "(A)"; those with stations, by "(B)"; those with stations and occasional descriptions of new or old species, by "(C)"; and those floras, in which a description, popular or scientific, is given of every plant enumerated, by "(D.)" Where these bracketed letters are omitted, the title of the flora has been obtained by us at second hand, and we have had no opportunity of verifying it.

W. R. G.
N. L. B.

I.—THE EASTERN STATES.

An account of some of the vegetable productions growing in this part of America, botanically arranged. By Rev. M. Cutler. (D.)
In Mem. Amer. Acad. Arts & Sci. Vol. i. Boston, 1785.

2 Enumeration of some New England Lichens. By Edward Tuckerman. (D.)
In Jour. Bost. Soc. Nat. Hist. Vols. ii, iii and v, 1838–1847.

3 Contributions to New England Mycology. By Chas. J. Sprague. (B.)
In Proc. Bost. Soc. Nat. Hist. Vols. v and vii, 1856 and 1858.

4 Further enumeration of New England Fungi. By Chas. C. Frost. (A.)
In Proc. Bost. Soc. Nat. Hist. Vol. xii, 1868.

5 Notice of some rare Plants of New England, with descriptions of some new species. By Wm. Oakes. (C.)
From Hovey's Mag. Horticult. 8vo. pamph. pp. 8. Boston, 1841.

Notice of some of the Plants of New England. By Wm. Oakes (B.)
In Hovey's Mag. Horticult. Vol. xiii. Boston, 1847.

MAINE.

A Catalogue of the flowering Plants of Maine. (Includes vascular Cryptogams.) By George L. Goodale. (B.)
In Proc. Portland Soc. Nat. Hist. Vol. i. Portland, 1862.

Decades of Maine Fungi. By M. C. Cooke. (D.)
In Proc. Portland Soc. Nat. Hist. Vol. i. Portland, 1862.

The Portland Catalogue of Maine Plants. (A.)
Pub. by Port. Soc. Nat. Hist., 8vo. pamph. pp. 12. Portland, 1868.

NEW HAMPSHIRE.

10 Catalogue of the Plants of New Hampshire. By Wm. F. Flint. (A.)
In Geol. N. Hamp. Vol. i. Concord, 1874.

List of the Plants found in New Hampshire only on Alpine Summits. (A.) (Ibidem.)

Canadian Plants naturalized on Mt. Washington. (A.) (Ibidem.)

Catalogue of the Alpine and Sub-Alpine Flora of the White Mountains of N. H. By Prof. J. W. Chickering. (A.)

In "Field and Forest." Vol. ii. Washington, 1876.

List of Plants collected by E. W. Southwick on the White Mountains of New Hampshire, July 15, 1841, with notes and references. By J. Barratt. M. D. (B.)

From the "Classic." 8vo, pamph. pp. 11.

VERMONT.

Catalogue of Vermont Plants. By Wm. Oakes. (B.)

In Thompson's Nat. Hist. Vt. Burlington, 1842.

Appendix to Oakes' Catalogue of Vermont Plants. By Joseph Torrey. Ibidem. Ed. 1853.

Catalogue of Vermont Plants: Phaenogams by Geo. H. Perkins; Cryptogams, by Chas. C. Frost. (B.)

In Archives of Science. Vol. i. McIndoes Falls, 1872.

List of Vermont Equisetaceae and Filices. By Chas. C. Frost.

In Trans. Orleans Co. Soc. Nat. Hist. Vol. i, Newport, 1871.

Catalogue of the Plants of Middlebury. By Edwin James.

In Hall's Statist. Acc't. of Town of Middlebury, 1821.

MASSACHUSETTS.

Catalogue of the Plants growing without cultivation in the vicinity of Amherst College. By Edward Hitchcock. (B.) 8 vo. pamph. pp. 64. Amherst, 1829.

Catalogue of the Plants growing without cultivation in the State of Massachusetts. By Edward Hitchcock. (B.)

In Rep. on Geol., etc., of Mass. Amherst, 1833.

Massachusetts Catalogue of Plants. By Edward Hitchcock. (B.) 8 vo. pamph. pp. 54. Amherst, 1835.

Report on the herbaceous Plants of Massachusetts. By Chester Dewey. (D.)

In Zool. and Botan. Survey Mass. 8vo. pp. 278. Boston, 1839.

Report on the Trees and Shrubs growing naturally in the forests of Massachusetts. By Geo. B. Emerson. (D.) Boston, 1850.

Musci of Eastern Massachusetts. By Rev. J. L. Russell. (B.)

In Jour. Bost. Soc. Nat. Hist. Vol. v., 1845.

Catalogue of the Plants growing without cultivation within thirty miles of Amherst College. By Edward Tuckerman and Chas. C. Frost. (B.) 8vo. pamph. pp. 98. Amherst, 1875.

Berkshire County.

*Catalogue of Berkshire County Plants. By Chester Dewey.

Bristol County.

Catalogue of Plants found in New Bedford and its vicinity. By E. W. Hervey. Pamph., 1860.

Dukes County.

Flora of Penikese Island. By D. S. Jordan. (A.)

In Amer. Naturalist, Vol. viii, 1874.

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* We have mislaid our reference to this list, and publish the title hoping some reader of the BULLETIN may be able to supply the date and place of publication.

Essex County.

24 List of Plants collected in Salem and its vicinity, in 1857. By S. B. Buttrick. (A.)

In Proc. Essex Inst. Vol. ii, Salem, 1860.

25 List of the Ferns of Essex County. By John Robinson. (B.)

In Bull. Essex Inst. Vol. vii, Salem, 1875.

Suffolk County.

26 Florula Bostoniensis; a collection of the Plants of Boston and its vicinity. By Jacob Bigelow, M.D. (D.) 8vo., pp. 268. Boston, 1814. (enlarged editions, 1824 and 1840.)

27 Beautiful Plants growing wild in the vicinity of Boston. By E. B. Kenrick. (D.)

In Gardeners' Mag. Vols. i and ii. Boston 1835–6.

List of Fungi collected in the vicinity of Boston. By D. Murray and Charles J. Sprague. (A.)

In Proc. Bost. Soc. Nat. Hist. Vol. vi, 1856.

List of Fungi found in the vicinity of Boston. By W. G. Farlow, M.D. (A.)

In Bullet. Bussey Inst. Mar. 1876 and Jan., 1878.

RHODE ISLAND.

Catalogue of Rhode Island Plants. By S. T. Olney. (A.)

Published by the Franklin Society. 8vo. pamph. pp. 8. Providence, 1844.

31 Catalogue of Plants collected by the Botanical Department of the Providence Franklin Society, principally in Rhode Island, in 1844.

Additions to the published lists of the Providence Franklin Society. By S. T. Olney. (B.)

In Proc. Providence Franklin Soc. Vol. i, 1846 and 1847.

CONNECTICUT.

List of the marine Algae growing in Long Island Sound within twenty miles of New Haven. By F. W. Hall. (B.)

In Bullet. Torr. Bot. Club. Vol. vi. New York, 1876.

List of Lichens growing within twenty miles of Yale College. By F. W. Hall. (B.)

In Amer. Naturalist. Vol. xi. 1877.

Catalogue of the flowering Plants and higher Cryptogams growing without cultivation within thirty miles of Yale College. (B.)

Pubd. by the Berzelius Soc. 8vo. pamph. pp. 72. New Haven, 1878.

Litchfield County.

List of Plants growing spontaneously in Litchfield and in its vicinity. By John P. Brace. (B.)

In Silliman's Journal, Vol. iv. 1 ser. 1822.

New Haven County.

Catalogue of the phaenogamous Plants and the Ferns growing without cultivation within five miles of Yale College. By William Tully, M.D. (A.)

From Appendix to Baldwin's Hist. Yale College. 8 vo. pamph. pp. 38. New Haven, 1831.

§ 88. **Publications.**—1. *American Journal of Science*, July—October. There are several valuable notes by Dr. Gray in these numbers. In that for July the action of light on vegetation is discussed briefly in view of the recent investigations of Schübeler, Siemens, Flahault, and Pringsheim. He points out that the familiar case of a bright green embryo in the seed of radish, violet, maple, etc., is not properly due to the formation of chlorophyll in darkness, for during growth the coverings are to a considerable extent translucent, but the peculiarity is that this chlorophyll remains for a very long while unaltered in darkness. As regards the nutritive value of more light and less heat it is too soon for final conclusions. [See also Gilbert's address on Agricultural Chemistry, *Nature*, Sept. 16, 1880]. In the August and September numbers is a review of De Candolle's Phytography, a volume, Dr. Gray says, which is "a needful supplement to the *Philosophica Botanica* of Linnaeus, and the *Théorie Elémentaire* of the elder De Candolle, the two classical books which the serious botanical student should early and thoroughly master. We believe that if Dr. Gray's notes could be obtained separately they would form a valuable appendix to the original volume, from which it is our intention to publish some extracts soon, on the value of herbaria.

2. *Botanical Contributions*, by Asa Gray, (Proc. Am. Acad. Sci., Vol. XVI.) These contributions consist of four sections. The first, on some *Compositae* gives some of the results reached for the Synoptical Flora of North America, as this portion of that work cannot immediately be published. For those who have to determine specimens, particularly of Western plants, it will prove in the meanwhile indispensable. *Vernonia altissima*, Nutt., is restored; *Coelestina maritima*, T. & G., becomes *Ageratum littorale ; Eupatorium parviflorum;* Ell., becomes *E. ambiguum*, Hook.; *Liatris fruticosa*, Nutt., is placed in a new genus, *Garberia ; Greenella* is also a new genus, with the species *Arizonica*, of S. Arizona. Among *Solidagos* we notice that Chapman's *S. odara* becomes a new species, *S. Chapmanii.* But not to go into particulars, those interested in *Townsendia*, *Erigeron* and *Aster* in particular, must have recourse to these notes. Part second gives six new *Asclepiads;* part third, *Geniostemon*, a new genus of Gentians; part fourth, miscellanies, among which we notice *Sedum Meehani* from Utah, and *Reverchonia*, a new genus of *Euphorbiae* from Texas, allied to *Phyllanthus.*

3. *Systematic Fern-List*, a Classified list of the known Ferns of the the United States, with the geographical range of the species, by Daniel C. Eaton. New Haven, 1880. There are here given 151 species of ferns, including the *Ophioglossaceae*, and also one or two species which came too late for insertion in the Ferns of North America. In a preliminary note it is stated that since Mr. Brandegee has discovered *Cystopteris montana* in Colorado, there remain no ferns known as inhabiting British America which are not also found in the United States. The list is intended as a check-list, and may be obtained from the author at the price of ten cents for single copies, or one dollar for fifteen copies, or will be sent in exchange for good specimens of rare or interesting ferns.

We take this opportunity to congratulate the author and publisher on the completion of the "Ferns of North America," which makes two handsome volumes, with preface, additions and corrections, list of plates, conspectus of scientific arrangement, and index. We understand that Mr. Cassino, if sufficiently encouraged, will make arrangements to publish such additional discoveries as may from time to time occur.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VII.] New York, November, 1880. [**No. 11**

§ 89. **Proceedings of the Torrey Club.**—The regular meeting of the Club was held at the Herbarium, Columbia College, Tuesday evening, October 12th, the Vice-President in the chair. There were sixteen members and four visitors present.

Plants Exhibited.—Mr. Britton exhibited a section of the trunk of the cork oak, *Quercus Suber*, L., brought by Mr. I. C. Russell from Morocco, and a pod of *Cassia fistula*, L., from Cuba, where the plant has been introduced from the East Indies. Mr. Brown showed a number of adventive plants gathered on the ballast grounds at Communipaw. Among these was *Richardsonia scabra*, St. Hil., (the Mexican clover), *Waltheria Americana*, L., and *Malvastrum tricuspidatum*, Gray.

Teratology.—Mr. Leggett exhibited a specimen of *Fraxinus Americana*, from Albany, in a hypertrophied condition—the terminal pedicels being swollen and distorted and the flowers entirely wanting. Miss Knight reported the detection by her of the white-flowered variety of *Campanula rotundifolia*, L., at Mount Desert Island, during the summer.

Field Meetings.—The complete report of the Committee on field meetings for the year was read and accepted. From this, the following notes are selected as worthy of record: At the meeting of June 12th, in the low grounds and woods at the base of the first Newark Mountain, *Phlox pilosa*, L., *Aristolochia Serpentaria*, L., *Euonymus Americanus*, L. (typical form), *Habenaria virescens*, Spreng., were found. On June 26th, at Little Ferry, N. J., *Aletris farinosa*, L., and a considerable quantity of a double-flowered form of *Ranunculus repens*, L., were collected. At Ridgewood, L. I., July 1st, some of the more noteworthy plants collected were *Elatine Americana*, Arnott, *Monarda fistulosa*, L., *Eriocaulon decangulare*, L., *Glyceria obtusa*, Trin., (new to Long Island), and a species of *Isoetes*. August 7th, White Plains was visited and found to be a new station for *Lechea Novae-Caesareae*, Aust., *Heliopsis laevis*, Pers., *Chamaelirium luteum*, Gray, and *Aspidium Goldianum*, Hook. On Aug. 14th, an excursion was made to Fort Lee, N. J., an old station for *Pogonia pendula*, Lindl. The plant was again detected, and in considerable quantity—both the white and purple-flowered varieties being represented. The stems of some of the plants bore as many as six flowers. On September 11th, the Club visited Huguenot, Staten Island. *Mimulus alatus*, Ait., (new to the Island), was found here, as was also the fungus, *Boletus albo-ater*, Schw., which, according to local catalogues, does not appear to have been hitherto detected since the time of Schweinitz. At this locality the members had an opportunity of observing the behavior of humble-bees in gathering nectar from *Gerardia pedicularia*, L. In no case did the insects enter the door that was wide open to them but invariably perforated the base of the corolla (Cf. Bailey, BULLETIN, ii, p. 39). At Tenafly, N. J., Sept. 25th, *Gentiana crinita*, Froel., was found in profusion, and a single specimen of the curious fungus, *Mitremyces*, was detected. October 2nd an excursion was made to Tottenville, S. I., a locality possessing a flora similar to that of the pine barrens of New Jersey. *Opuntia Rafinesquii*, Englm., and *O. vulgaris*, Mill, were both found here, growing in the sand. It was observed that nearly all the *Pteris aquilina*, L., growing in this sandy tract had caudate pinnules, as in the variety *caudata*, Hook., of that fern. Prof. Eaton, however, to whom specimens were submitted, says he cannot regard the form as the genuine *caudata*, inasmuch as the pinnules are not nearly narrow enough. October 9th, at Woodlawn, the only plant found worthy of record was *Aster multiflorus*, Ait.

Leontodon autumnale, L.—Mr. J. D. Hyatt, in some remarks on this plant, stated that he had been much struck by its abundance in the cities and villages of the Eastern States—particularly at Boston and Newport, where it seems to be as common as is the dandelion (*Taraxacum*) with us.

Notes on the Local Flora.—Mr. Brown remarked that, under the guidance of Mr. Bower, the spot where *Cheilanthes vestita*, Swartz, was some years ago found by Mr. Denslow, was visited in August, and this fern, so rare in the State, was detected still flourishing in a little patch of about two feet square. Near it were found in abundance, *Commelyna Virginica*. L., *Stylosanthes elatior*, Swartz, and *Opuntia, vulgaris*, Mill. Mr. Brown further stated that on the western border of "Train's Meadow," near Woodside, L. I., *Gentiana crinita*, Froel., *Parnassia Caroliniana*, Mich., *Spiranthes graminea*, Lindl., var., *Walteri*, Gray, and *Sorghum nutans*, Gray, are to be found in abundance. Mr. Bicknell reported the following new stations: *Prunus Pennsylvanica*, L., and *Viola pedata*, L., Var., *bicolor*, Gray, below Inwood; *Sagina procumbens*, L. and *Sparganium eurycarpum* Englm., in vicinity of Williams' Bridge; *Sabbatia chloroides*, Pursh., less than a mile north of King's Bridge; *Asclepias obtusifolia*, Michx., along Harlem River above Morris' dock; *Scirpus polyphyllus*, Vahl., by Tibbit's Brook, at city limits; *Oryzopsis melanocarpa*, Muhl., rocky woods, city limits, with *Brachyelytrum aristatum*, Beauv.; *Glyceria elongata*. Trin., Tibbit's Brook, city limits; and *Andropogon Virginicus*, L., wet meadow at tide water, about a mile north of King's Bridge.

§ 90. **Notes on the New Jersey Flora.**—During August, in the vicinity of Long Branch, the following plants were observed, at stations not, I believe, previously reported in the BULLETIN:

At Neversink Highlands, *Monarda punctata*, L., *Eupatorium album*, L., and *Quercus Prinus*, L., var. *monticola*, Michx.; the latter abundant, with acorns 15″ long and with cups perfectly conical (6″ long and broad), which Gray's Manual speaks of as not having been seen by the author in full grown specimens.

At Seabright, *Helianthus angustifolius*, L., *Habenaria tridentata*, Hook., *Botrychium ternatum*, Swartz, var *obliquum*, Milde.

At Monmouth Beach Centre, *Tripsacum dactyloides* L., and *Aster multiflorus*, Ait.

At Ocean Grove, *Quercus Phellos*, L., (tree 40 feet in height), and *Nicandra physaloides*, Gaert.

At Spring Lake, *Eryngium Virginianum*, Lam. (abundant), *Euphorbia corollata*, L., *Eupatorium pubescens*, Muhl., *Hieracium Gronovii*, L., and *Gratiola aurea*, Muhl.

ADDISON BROWN.

New York, Oct. 7th, 1880.

§ 91. **Vernation of Botrychium boreale,** Milde.—The re-discovery of *Botrychium boreale* in Unalaska by Mr. L. M. Turner, is not only a pleasing testimony to the accuracy of that distinguished cryptogamic botanist, Dr. Milde, but has been the means of placing in my hands two very fine root-specimens, and thus given me an opportunity to re-examine the vernation in this species.

In my paper on "Vernation in Botrychia," published in THE BULLETIN, January, 1878, it was stated that the description and figures of the bud in this species was based on a single specimen, and that, as the character of the bud-form in the other species had been found to be constant, it was assumed that such would prove to be the case with *B. boreale* also. But an examination of the present buds renders some modification of the previous description necessary.

The general character of the bud is the same in all three specimens, but the two buds now examined show that the appearance of the apex of the fertile portion outside of the sterile in the original bud, as shown in the published figure on the plate which accompanied my paper, was due to the manner in which that particular bud was pressed, the over-pressure having forced it out from its natural position. The oblique arrangement of the sterile segments in that bud, as shown by the dotted line through the figure cited, may also have been due, in part, at least, to the same cause, as it is less marked in the present buds. If pressed perfectly flat, however, with the fertile portion forced out of its place, these buds would correspond very well with the published figure. The apparent difference between them may be thus explained.

Since the publication of my paper, I have examined a large number of additional freshly-gathered, as well as dried specimens of *B. matricariaefolium* and *B. lanceolatum*, as well as many of *B. simplex*, and *B. Lunaria*—no specimen being allowed to pass through my hands without such an examination—in all stages of growth, and found the bud-form in those species an unvarying test-character. Whether it will prove to be so in *B. boreale*, or not, can only be determined by the examination of a larger amount of material; but it appears safe to assume, from analogy, that it will.

The bud is nearest to that of *B. Lunaria* but the apex of the sterile portion overlaps, and turns downward over the fertile further; the mid-rib is stouter, and the distinct character of the sterile segments is plainly to be seen. On examining the buds of the two species together, I find no difficulty in separating them. More material is needed before a permanently satisfactory description can be given.

My thanks are due to Dr. J. Schneck for so kindly contributing to the herbarium these valuable specimens—apparently representing the forms *evolutum* and *affine* as described by Angström, and quoted by Milde in his "Botrychiorum Monographia"

GEO. E. DAVENPORT.

Dav. Herb., Oct., 1880.

§ 92. **The Herbaria and Botanical Libraries of the United States,** III.—THE HERBARIM OLNEYANUUM OF BROWN UNIVERSITY.—The herbarium of the late Col. Stephen T. Olney of Providence, R. I., was left by his will to Brown University, on condition that it be placed in a fire-proof building. It is probably known to the readers of the BULLETIN that Col. Olney was an invalid and incapacitated for business during the last years of his life. At that time the herbarium, which had been stored by the owner in Butler Exchange, was transferred by the trustees to the fire-proof library building of Brown University, the only edifice possessed by the college which would fulfil the requirements. The present writer was requested to examine and arrange the collections, which he did in connection with Mr. James L. Bennett of this city. He is greatly indebted to this gentleman for valuable suggestions and assistance which his natural neatness of method and mature experience rendered easily possible. He it was who arranged the *Carices*, (which were Col. Olney's specialty), together with the lower Cryptogams, many of which he had himself collected.

We found this elegant herbarium, one hardly surpassed by any private collection in America, badly injured by insects. The first work, then, was to poison what could be saved. It is not an exaggeration to say that one-third of the Phanerogams had suffered. In places a whole genus would be riddled by the *Anthrenus*. It was a sad sight; for the specimens had been prime, were superbly mounted, and many of them impossible to replace. Col. Olney was so neat in his methods that he disliked to see a blemish on any paper; hence his very sense of order was perhaps a means of loss. Every plant had to be thoroughly poisoned. Now that the college has come into possession, it will be necessary to throw out mutilated specimens and replace them by others. Mr. Bennett and the present writer stand ready to fill the vacancies from their own herbariums.

The collection is a fine one in every way. In Rhode Island plants it is only equalled by that of Mr. Bennett. It is very rich in Southern and Western plants of Hale, Chapman, Curtis, Ravenel, Fendler, Parry, Thurber and many other well known collectors. There is a fine set of Wright's Cuban plants, of Robin's *Potamogetons*, of Sullivant's and Austin's Mosses, etc., etc. Indeed, the owner spared no expense (and he was a wealthy man) to build up his herbarium. In the genus *Carex* it must long remain unique and classic. There is much raw material and many duplicates in *Carex*. As Col. Olney's correspondence shows him to have been in debt as regards exchanges, the writer, who now has charge of the herbarium, would be pleased to communicate with such botanists as have not received returns. He will then, acting under the direction of the college authorities, endeavor to discharge all such obligations. Col. Olney bequeathed a fund of $10,000 for the increase of his herbarium and library. The latter, containing 712 volumes also comes to Brown University, together with his Chevalier and Smith & Beck's microscopes and much valuable apparatus and material. With another $25,000 left by the deceased Colonel, a professorship of Natural History has been created. One of the duties of the professor is to give lectures on Botany.

In these random notes are stated only a few of the points suggested by the subject. It will be seen that Brown University has received a royal legacy, and has the nucleus upon which to build up a really fine herbarium. The present situation of the plants, while meeting the requirements of the will, is not at all what a botanist could wish. The shelves are crowded and unfit for the purpose; there is no work-room, and most of all, the books one needs for consultation are at the extreme other end of the building. These draw-backs will be rectified, no doubt, as time goes on. Our college is growing in every way, and is making especially rapid strides in science since the advent of Dr. A. S. Packard, Jr. He asks the assistance and co-operation of botanists throughout the country. Such as assist us will receive every courtesy.

Col. Olney's library contains many valuable illustrated books, together with those which are indispensable to a working systematist. It is weak in morphological and histological works, but the University is fast supplying the deficiency. The botanical correspondence covers many pages, and is carefully filed. Original letters from Torrey, Gray, Hooker, Englemann, Canby, Thurber, and a host of others, will always afford a treasure house of information.

W. W. BAILEY.

Brown University, Providence, Sept. 10, 1880.

Let me add, by way of postscript, that the Providence Athenaeum now possesses many fine botanical works, and that the Public Library has requested the writer to make out a list for purchase. These, with the collections of the college, of Mr. Bennett, of Mr. Arnold Green, and the writer, afford a pretty good opportunity for useful work. W. H. B.

§ 93. **A Laminaria new to the U. S.**—In the month of August last, I collected on the coast of Maine, a *Laminaria* which I think must be the species described by Agardh in his *Species Algarum* as *L. longipes*, Bory. I have not been able to make comparison with an authentic specimen of this species, but my plant corresponds very well with Agardh's description.

The most striking character of the plant is its extreme length compared with its breadth. In what appeared to be full grown plants, the length was from one to two metres, and the breadth two to seven centimetres, the last breadth being found only in the longest and oldest plants, the tips of which had already begun to decay. I have one specimen which now, in the dry state, measures as follows: length of stipe, 12 cm.; lamina, 1 m. 45 cm.; breadth of lamina exactly 1 cm. I think such proportions have never been met with in any other *Laminaria*.

[illegible]

The stipe of this species is solid and quite terete, and always exceeds in length several times the breadth of the lamina. The latter is strong, and as thick as in a plant of *L. saccharina*, Lam. of the same length; is not at all wrinkled, and, with the exception of a short tapering at the base and apex, is absolutely linear, the edges for the whole length being as perfectly true as if cut by machinery.

I found this plant growing at a place known as Fox Island (though it is not an island) near the mouth of the Kennebec. The whole rock, from a short distance above low water mark to an unknown depth, was completely covered with it, no other *Laminaria* growing with it. All the other rocks in the neighborhood were covered by either *L. saccharina*, Lam., or *L. longicruris*, De la P., and I saw none of this plant among them. I also found a few fronds of *L. dermatodea*, De la P., cast up by the waves; but I saw no specimens that seemed in the least to connect the new form with any other species.

FRANK S. COLLINS.

Malden, Mass.

§ 94. **Phegopteris Dryopteris,** Fée.—Is not Hampshire Co., W. Va., a much more southerly station for this fern than has been yet reported? In June last it was growing finely and profusely on the right bank of New Creek, two miles above the junction with the Potomac.

JOHN DONNELL SMITH.

Baltimore., Oct. 27.

§ 95. **A Viviparous Grass.**—Mr. E. S. Wheeler has kindly sent me from Berlin, Mass., specimens of **Phleum pratense*, L., in which the changed appearance of the spike is so complete and so great that it would puzzle any one but an expert agrostologist to decide positively as to the species. Speaking of the metamorphoses of the floral organs of grasses into leaves, Dr. Masters (*Veg. Teratol.*, p. 168) says: "In these cases it generally happens that the outermost glumes are changed; sometimes, however, even the outer and inner paleae are wholly unchanged, while there is no trace of squamulae or of stamens and pistils within them, but in their place is a small shoot with miniature leaves arranged in the ordinary manner." The changes in the *Phleum* under consideration come under none of these categories, but agree, rather, with those observed by †Mohl in a viviparous state of *Poa alpina*, L.—a study of which, in its various stages, led him to the conclusion that the inferior palet is but a bract from whose axil the floral axis takes rise, and not, as Brown had theorized, a perianthial leaf. In the *Phleum* sent me by Mr. Wheeler, every one of the inferior palets has been transformed into a perfect leaf, with its lamina, ligule, and sheath; the latter proceeding from a joint on the

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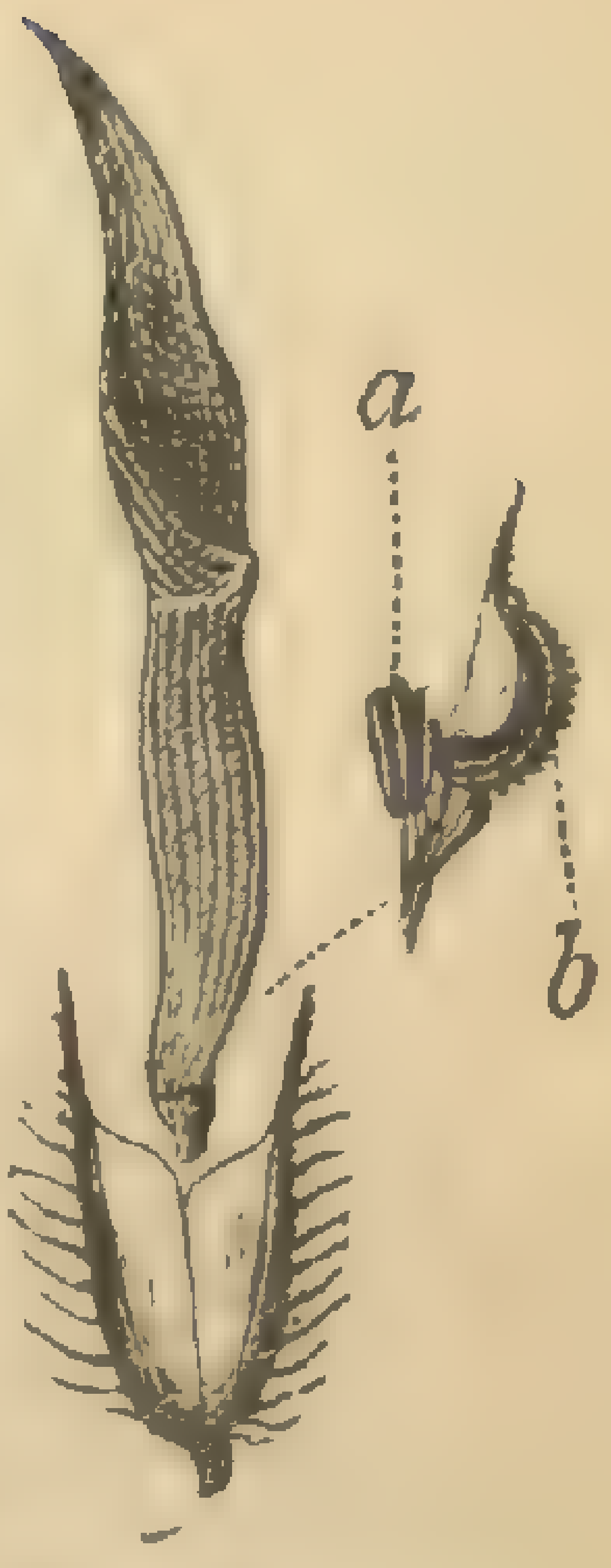
*In the *Flora of Richmond Co.*, (p. 33), this same form is said to be occasionally abundant late in the season, on Staten Island.

†*Ann. & Mag. Nat. Hist.*, Vol. XV., p. 174, from *Botanische Zeitung*, January, 1845.



slightly prolonged rachis, as seen in the accompanying sketch, in which the leaf is shown detached and raised above the glumes. On laying open one of these leaves, I find, in the majority of cases, seated on a minute prolongation of the rachis, three stamens; their immature green anthers lying side by side, and being subtended by a membranous bract having a narrow, green, minutely mucronate keel. This bract occupies the position of the superior palet; but, unlike the latter, it has a strongly pointed tip. In two instances, I detected a still further change in this bract, which, elevated yet higher within the investing sheath, had assumed the form shown at *b* in the annexed figure. Here, the structure was intermediate between that of a glume and that of the blade of a young leaf, the bract being carinate, and strongly compressed; having scarious margins, with about three veins on each side of the broad, dark green, minutely mucronate keel; and being tipped with a scabrous awn. At the base was a rudimentary sheath, and in the axil of this were seated the three stamens. The development of the sheath subsequent to the formation of the lamina in these instances is in accordance with observations already made by ‡Van Tieghem. In none of these monstrous flowers is there the least trace of ovary or of the scales which usually accompany it; but in every case the stamens are present. In the annexed figure, the metamorphosed flower is represented about double natural size; while the stamens (*a*) and the transformed superior palet (*b*) are shown magnified about four diameters.

W. R. GERARD.

§ 96. **Botanical News**—*The Color of Flowers.*—At a recent meeting of the Vaudois Society of Natural Science, says *La Nature*, Prof. Schnetzler read an interesting paper on the color of flowers. Hitherto it has generally been supposed that the various colors observed in plants were due to so many different matters—each color being a different chemical combination without relation to the others. Now, however, Prof. Schnetzler shows by experiment that when the color of a flower has been isolated by putting it in alcohol, one may, by adding an acid or an alkali, obtain all the colors which plants exhibit. Plants of paeony, for example, yield, when macerated in alcohol, a violet-red liquid. If some acid oxalate of potassa be added, the liquid becomes pure red; while soda changes it, according to the proportion used, into violet, blue, or green. In the latter case, the green liquid appears red by transmitted light, just as solution of chlorophyll does. The sepals of paeony, which are green, bordered with red, become wholly red when placed in a solution of acid oxalate (binoxalate) of potassa. These changes of color, which may be obtained at will, may quite well be produced in the plant by the same causes; since, in all plants, there always exist acid or alkaline matters. Further, it is stated that the transformation from green into red, observed in the leaves of many plants in autumn, is due to the action of the tannin which they contain, on the chlorophyll. Thus, without desiring to affirm it absolutely, Prof. Schnetzler supposes *a priori* that there is in plants only one coloring matter—*chlorophyll*, which, being modified by certain agents, furnishes all the tints that flowers and leaves exhibit. As for white flowers, it is well known that their cells are filled with a colorless fluid, opacity being due to air contained in the numerous lacunae of the petals. On placing the latter under the receiver of an air-pump, they are seen to lose their opacity and to become transparent as the air escapes from them.

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‡*Ann. des Sci. Nat.* Ser. 5, Tome XV., 1872, p. 236.

Pilosity as a Teratological Phenomenon.—Hitherto, teratologists have considered undue pilosity, or the adventitious production of hair in plants, as a matter of minor importance, but M. Ed. Heckel, in a recent note to the French Academy (*Comptes Rendus*, xci., p. 349), insists that there are certain phases of this sort of change in plants which have a higher significance than that of a simple variation. He proposes to divide the phenomenon into the following three categories:

(1.) *Physiological Pilosity*, which includes the formation of hairs, or the increase in number of these, on the parts of plants where they are normally present, or even entirely wanting. Such cases are oftenest seen when plants change their habitat from a wet to a dry soil. This sort of physiological adaptation takes place within quite narrow limits; and it varies from glabrousness to pilosity unaccompanied by any alteration of specific characters.

(2.) *Teratological Pilosity*, which begins at the moment the specific habit is altered, and acquires its maximum when the modifications are profound enough to suggest the idea of a new species. A large number of conditions capable of producing nutritive troubles in plants may give rise to this peculiar phenomenon, which M. Heckel proposes to introduce into teratological literature under the distinctive term of "Deforming Pilosity" (*Pilosisme deformant*).

(3.) *Pilosity due to the Sting of Insects or to Organic Variations*, which is clearly distinguished from the former in being very localized (e. g. certain galls, the filaments of *Verbascum* with aborted anthers, etc.,) and which cannot change the habit of the species.

Of changes due to *deforming pilosity*, M. Heckel gives two prominent examples which he has studied, *Lilium Martagon*, L., and *Genista aspalathoides*, Lam. The alterations in the last-named plant are so profound that its monstrous state has even been described by De Candolle as a species, under the name of *G. Lobelii*; while by Morris it has been regarded as a marked variety, and named by him var. *confertior*.

§ 97. **Publications.**—*Arboretum Segrezianum, Icones Selectae Arborum et Fruticum* in *Hortis Segrezianis Collectorum.* Descriptions of figures of new, rare, or critical species of the Arboretum of Segrez. By Alphonse Lavallée. We are indebted to Mr. F. W. Christern for a specimen copy of *Livraison I* of this magnificent work. It contains six plates as follows: I and II. *Juglans Sieboldiana*, Maxim; III. *Ostryopsis Davidiana*, Decaisne; IV. *Elaeagnus longipes*, Gray; V. *Crataegus cuneata*, Sieb. & Zucc.; VI. *Jamesia Americana*, T. & G., Flor. N. Amer. Vol. I (*not* II) p. 593. The work will form two volumes 4to, jésus (fol. 11 x 15 inches) of 60 plates each; and there will be published every three months one *livraison*, of 6 plates with descriptive text, at 10 francs each.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VII.] New York, December, 1880. **[No. 12**

§ 98. **Proceedings of the Torrey Club.**—The regular meeting of the Club was held at the Herbarium, Columbia College, Tuesday evening, November 9th, the President in the chair, and nineteen members and one visitor in attendance.

The donation to the Club's library was announced of two numbers of the *Characeae Americanae* by the author, Dr. T. F. Allen.

Plants exhibited.—Prof. Wood exhibited and remarked upon a number of specimens of plants from the North-western Territories, many of which are undescribed in American botanical works, and will probably prove to be new species. Among other interesting things was a specimen of *Aster praealtus*, a species which has long been lost sight of. Mr. Tweedy brought specimens of *Adiantum Capillus-Veneris*, L., gathered in Texas, and of *Aspidium aculeatum*, Swartz., var. *Braunii*, Koch, from Crane's Mountain, Warren County, N. Y. Miss Knight called attention to the fact that the last-mentioned fern was found by Prof. Benedict many years ago on Mount Marcy, and again in 1874 by Miss Edith Gleason, on the trail to Preston Ponds, in the Adirondack region, Essex County.

New Stations.—Mr. Bicknell gave the upper end of New York Island as a station for *Aster amethystinus*, Nutt., *Pycnanthemum Torreyi*, Benth. and *Desmodium viridiflorum*, Beck.

Albinism.—Mr. Britton reported that a white-flowered variety of *Cypripedium acaule*, Ait. had been detected the present season near Bridgeton, N. J., by Dr. J. Potter.

Large Cornus.—Mr. Britton also stated that at the last-named locality he had observed a specimen of *Cornus florida*, L., the trunk of which measured five feet and four inches in circumference.

Teratology.—Mr. Bicknell exhibited several chestnut "burs," each of which was composed of two involucres which had cohered by the edges of their contiguous valves so as to form but a single individual having six valves and enclosing seven nuts, one of which was seated directly on the line of cohesion. Mr. Bicknell also showed examples of heterophylly in the apple-tree. The leaves exhibited were nearly all deeply cut-lobed and sharply toothed, resembling those of *Crataegus coccinea*, and were taken from a tree which had run wild in the upper part of New York Island.

A Weeping Apple-tree. Mr. Britton remarked on an accidental variety of the common apple-tree which he had observed at Bridgeton, N. J., the present season, some of the pendulous and trailing branches of which were ten feet in length. The tree grew on the farm of Dr. J. B. Potter.

The President remarked at some length on the plants observed by him in the Western Territories this season, and signified his intention of exhibiting specimens to the Club as soon as they should be properly arranged.

One corresponding and two active members were elected.

§ 99. **Ballast Plants in and near New York City.**—In continuation of the lists of adventive plants found in and near this city in 1878 and 1879, previously reported in the BULLETIN (Vol. VI, pp. 256, 273, and 355), I give below the additional species found during the past season in the same localities.

The ballast grounds, however, at Hunter's Point, so fertile last year in species new to this region, and most of the grounds at Gowanus, have been almost wholly occupied for business uses, so that scarcely anything could be gathered there.

At Communipaw Ferry, also, the ballast deposits have been frequently dug up or covered; and since the middle of July a corps of laborers has been constantly employed in traversing the grounds about the railroad tracks where most of the plants were procured, and in digging up by the roots all traces of vegetation. What has been obtained there has been found during the intermission of their ravages.

At the 8th Avenue station and at 107th Street the grounds have been mainly undisturbed, as have a part of the grounds at Communipaw and Hoboken. It is somewhat remarkable that so many new species have been found this year on these old deposits, as the seeds must have been brought there with the ballast at least four years ago, and would have been noticed had they produced plants last year.

The greater part of the plants from Communipaw in the following list are, however, from *new* ballast earth used for filling about the railroad tracks, though the "wharf" before referred to has been undisturbed.

In May, and again in July, Mr. Martindale, who in previous years has collected so many ballast plants from the deposits about Philadelphia and Camden, went over our chief localities, and a number of the following species were first noticed by him as indicated in the list subjoined. I am indebted to him also as well as to Mr. Jones, at the Cambridge Herbarium, for the determination of some other species, and to Dr. Thurber for grasses.

A few corrections should be made in the list for last year.

No. 76, for *Brassica monensis* read *B. CHEIRANTHUS, Vill.

No. 117, for *Trifolium elegans* read T. HYBRIDUM.

No. 182 is *Echium vulgare*, with long spreading branches, very different in appearance from the usual form.

No. 240, for *Anthericum ramosum*, read *ASPHODELUS RAMOSUS, L. (A. microcarpus, Vis.)

Of the 258 species previously reported, upwards of 200 were found again this year; and if the species be omitted that were only found last year at the stations at Hunter's Point and Gowanus since destroyed, more than nine-tenths of last year's species re-appeared this year at the same localities.

In the following list the plants not in Gray's Manual are printed in *italics* or in small CAPITALS, the latter designating such as are not known to the writer to have been previously published as found in this country. Those not previously reported within our local limits (30 miles) are indicated by an asterisk (*); and the dagger (†) indicates those which Mr. Martindale reports also from Philadelphia or Camden. The station near Communipaw Ferry is indicated by "Com."; Hoboken by "Hob."; Hunter's Point by "H. Pt."; and Gowanus by "Gow." Where not otherwise stated the plants are believed to be European. A number belong to the shores of the Mediterranean, a few are from South America, and others from the Southern or South-western States:

†259.* *Ranunculus arvensis*, L.—May–June. Com. 8th Ave.

260.* RANUNCULUS LANUGINOSUS, L.—May. Com. 1 plant only. Wharf.

†261.* Papaver Argemone, L.—May–June. 107th St., 8th Ave.

†262. Argemone Mexicana, L.—July. Com. 1 plant.

†263.* *Eschscholtzia Californica*, Cham.—June. Com. 1 plant Cal.

†264.* *Sisymbrium Irio*, L.—June–July. Com. 8th Ave.

76.* BRASSICA CHEIRANTHUS, Vill.—June–July. Hob. Abundant.

†265.* *Diplotaxis muralis*, DC.—May–July. 107th St. Same as var. *integrifolia* in former No. 75.

†266.* DIPLOTAXIS ERUCOIDES, DC.—Aug.–Oct. Com. Flowers white.

†267.* Lepidium intermedium, Gray.—May–June. Com. Western.

268.* LEPIDIUM SMITHII, Hook.—July. Com. 2 plants. (Martindale.)

269.* IONIDIUM PARVIFLORUM, (?).—Aug.–Sept. Com. So. Am.

†270.* *Dianthus barbatus*, L.—July. Com. Both white and pink flowers.

271.* SILENE ITALICA, Pers.—June–July. Com. Wharf,

272.* SILENE PENDULA, L.—July. Com. 1 plant.

†273.* *Lychnis diurna*, Sibth.—May–July. Com. Wharf. 8th Ave.

274.* *Lychnis Flos-cuculi*, L.—May. Com. Wharf. 1 plant.

†275.* *Stellaria aquatica*, Scop. (*Cerastium*, L.)—Aug.–Oct. 8th Ave.

†276.* *Corrigiola littoralis*, L.—June–Nov. Com. Spreads upon the sand like carpet-weed. An interesting addition to our few representatives of the order *Paronychieae*.

†277.* *Malvastrum tricuspidatum*, Gray.—Sept. Com. Scarce. S. W.

†278.* *Sida carpinifolia*, L., var. *brevicuspidata*, Griseb. (*S. stipulata*, Cav.)—Sept. Com. S. W.

279.* *Pavonia hastata*, Cav.—(*P. Lecontei*, T. & G.) Sept. Com. 2 plants. S. W.

280.* *Waltheria Americana*, L.—Sept. Com. Not in flower. S. W.

†281.* *Geranium molle*, L.—May. 107th St.

†282.* Geranium dissectum, L.—May. Com.

†283.* ERODIUM MALACHOIDES, Willd.—May. 107th St.

†284.* Oxalis corniculata, L.—Sept.–Oct. Com. Stipules small but evident.

†285.* ONONIS REPENS, L.—July. 107th St. Prostrate; spines 9". *O. arvensis*, L. was also found again this year at 8th Ave. It resembles *O. repens*, but is wholly without spines.

†286.* ONONIS SPINOSA, L.—June. Hob. Sub-erect; branches spreading, rigid, thorny.

†287.* TRIGONELLA CAERULEA, Ser.—July. 8th Ave. (Martindale.)
†288.* ANTHYLLIS VULNERARIA, L.—June–July. Com. 8th Ave. Also var. *rubiflora (A. Dilenii*, Schultz.*)*
†289.* TRIFOLIUM MARITIMUM, Huds.—July. 8th Ave. (Martindale.) 1 plant.
290.* TRIFOLIUM DALMATICUM, Vis. (?).—July. 8th Ave. One plant; may be *T. tenuiflorum*, Ten.; it has the long axillary sessile heads of *T. striatum*, but the smoother, rigid leaves of *T. scabrum*, with similar beautifully-arched veinlets; plumose teeth of calyx unequal, exceeding its tube, and equalling half the rosy corolla; decumbent.
†291.* MEDICAGO MARGINATA, Willd.—July. Com. Wharf.
†292.* *Medicago falcata*, L.—July. Hob. (Martindale.)
†293.* Medicago minima, Lam.—May–Aug. Com. 8th Ave.
†294.* MELILOTUS SULCATA, Desf.—July. Com.
295.* DORYCNIUM HIRSUTUM, DC., *(Lotus*, L.*)*—May–June. Com. Wharf.
296.* ORNITHOPUS COMPRESSUS, L.—Sept. Com. 1 plant. S. Am.
297.* ASTRAGALUS GLYCYPHYLLOS, L.—May–Aug. Com. Wharf.
298.* ADESMIA MURICATA, DC., var. DENTATA. (?).—Aug. Com. 1 plant. Chili.
†299.* *Vigna luteola*, Benth. *(V. glabra*, Sav.*)*—Sept. Com. Young pods very hairy.
300.* VICIA HYBRIDA, L.—May–July. 107th St. Standard and pods hairy. Flowers yellow.
301.* *Rhyncosia minima*, DC.—Oct. Com. South.
302.* *Desmanthus brachylobus*, Benth.—Sept. Com. W.
†303.* *Poterium Sanguisorba*, L.—June–Aug. 8th Ave. Com.
†304.* *Alchemilla arvensis*, Scop.—H. Pt. (J. Schrenk, 1879.)
305.* *Potentilla recta*, L.—July. 8th Ave. (Martindale.)
306.* *Apium leptophyllum*, F. Muell. *(Helosciadium*, DC.*)* Com. S.W.
307.* HERACLEUM SPONDYLIUM, L.—July. 8th Ave.
†308.* *Anethum graveolens*, L.—July. 8th Ave.
309.* CHAEROPHYLLUM TEMULUM, L.—June–July. Com.
†310.* *Scandix Pecten-Veneris*, L. May. Com. (Martindale.)
†311.* GALIUM PALUSTRE, L.—July. 8th Ave.
†312.* *Richardsonia scabra*, St. Hil.—Aug.–Sept. Com. S. Am.
†313. Fedia olitoria, Vahl.—May. 8th Ave.
†314. Dipsacus sylvestris, Mill.—July. 8th Ave.
314*a*.* BUPHTHALMUM SALICIFOLIUM, L.—July. Hob. 1 plant. Shortly afterwards plants all cut down.
†315.* Eclipta erecta, L.—July. Com. Quite erect. South. 3°.
†316.* *Acanthospermum hispidum*, DC.—July–Aug. Com. South.
†317. Achillea Ptarmica, L.—July. Com. Scarce.
318.* CENTAUREA PHRYGIA, L.—July. Com. Appendages very long recurved fimbriate.
†319.* *Senecio Jacobaea*, L.—July–Aug. 8th Ave. Hob. (Martindale).
†320. Onopordon acanthium, L.—July. 8th Ave. Hob. (Martindale).

†321.* *Carduus acanthoides*, L.—July–Aug. 8th Ave. Hob. (Martindale).
322.* CARDUUS CRISPUS, L.—July. 8th Ave.
323.* CARDUUS MULTIFLORUS, Gaud.—July–Aug. Gow.
172.* HIERACIUM UMBELLATUM, L.—Aug. Com. 1 plant. No. 172 of last year.
†324.* *Picris hieracioides*, L.—July. Com. Wharf. (Martindale).
†325 * *Scolymus Hispanicus*, L.—July. H. Pt. Hob.
†326.* *Heliotropium Curassavicum*, L.—July–Oct. Com.
†327.* *Heliotropium anchusaefolium*, Poir.—July–Aug. Com.
†328.* *Heliotropium Indicum*, L.—June. Com.
†329.* BORRAGO OFFICINALIS, L.—July. 8th Ave. 1 plant.
†330.* MYOSOTIS COLLINA, Hoff. (*M. hispida*, Schlecht.)—Aug. Com.
†331.* *Myosotis arvensis*, Hoff. (*M. intermedia*, Link)—Aug. Com.
†332. Symphytum officinale, L.—July. Com. Hob. The latter with purple flowers.
333.* *Dichondra repens*, Forst.—Sept. Com. Not in flower. S.
†334. Ipomoea coccinea, L. (*Quamoclit*, Moench.) Sept. Com. South.
†335.* *Ipomoea commutata*, R. & S.—Oct. Com. South.
†336. Solanum nigrum, var. Dillenii, Gray (sp. Schult.)—Sept.–Oct. Com.
†337.* *Solanum sisymbriifolium*, Lam.—July. 8th Ave. Gow. Also in 1879. South.
338. Solanum tuberosum (?)—July–Oct. Com. Perfectly regular leaflets, filamentary white roots, no tubers. West.
†339.* *Hyoscyamus albus*, L.—July. Com. (Martindale).
340* DIGITALIS LUTEA, L.—July. 8th Ave. 1 plant.
†341.* *Scoparia flava*, C. & S.—Sept. Com. 2 plants. So. Am.
†342. Veronica hederaefolia, L.—May–Aug. 8th Ave. Hob. Com.
†343.* *Orobanche minor*, Sutt.—May. 107th St. 1 plant.
344.* AJUGA GENEVENSIS, L.—May–June. 107th St. Scarce.
†345. Origanum vulgare, L.—Aug.–Sept. 8th Ave.
†346.* *Salvia verbenaca*, L.—Aug. Com. 1 plant.
†347.* *Galeopsis angustifolia*, Ehrh. (*G. Lad.* var. *ang*)—July–Oct. 8th Ave. Abundant.
348.* GALEOPSIS VERSICOLOR, Curt.—July. Com.
†349.* STACHYS RECTA, L.—July–Aug. Com. Wharf. (Martindale.)
†350.* *Plantago coronopus*, L.—June. Gow.
†351.* *Amarantus blitoides*, Watson.—July. 8th Ave. (Martindale.)
352.* *Cladothrix lanuginosa*, Moq. (*Alternanthera*, DC.)—July–Sept. Com. S. W.
353. Polygonum ramosissimum, Michx.—July. 8th Avenue. (Martindale.)
†354.* *Phyllanthus polygonoides*, Spreng.—Sept. Com. Mex.
†355.* CYPERUS UMBELLATUS, Vahl.—Sept. Com. China?
†456.* Carex hirta, L.—May. 8th Ave. (Martindale.)
357.* PHLEUM ARENARIUM, L.—May. 8th Ave. (Martindale).
†358.* *Sporobolus Indicus*, Br.—Sept. Com.
359. Eleusine Indica, var. *BRACHYSTACHYS, Trin.—Sept. Com.

360.* GLYCERIA PROCUMBENS, Sm.—June. 8th Ave.
361. Poa trivialis, L.—May. 107th St.
†362.* Festuca Myurus, L.—May. 107th St.
†363.* *Hordeum murinum*, L.—July. Com. 8th Ave.
364.* *Paspalum distichum*, L.—June–Aug. Com. So.
365.* Equisetum variegatum, Schlecht.—June. Com.

New York, Dec. 3, 1880. ADDISON BROWN.

§ 100. **The Value of Herbaria.**—The following extracts from *La Phytographie par Alph. De Candolle*, *Paris*, 1880, merit the consideration of those who may have it in their power to promote the growth of our public collections of dried plants:

The purposes of Herbaria are to acquaint us with the exact names of plants, to furnish the materials necessary for their description, and to preserve the evidences or explanations in regard to descriptions already published.

Collections of this nature are superior to those we can have in Zoology. Dried plants are in a condition of completeness or nearly so. whereas shells, skeletons or stuffed animals exhibit merely certain portions of the organism. They have usually several flowers or fruit, and these admit of additional dissection for their verification. Specimens are so little altered in drying, that it is easy by means of a simple immersion to view the most minute and delicate organs. In certain cases we see them even better than in the living plant; as for instance when we examine ovules involved in a pulpy substance, or membranes that become very nicely separated by desiccation.

If we compare collections of dried plants with those of living ones, the respective advantages are more evenly balanced than is generally supposed. In a Herbarium we see simultaneously specimens of neighboring species, and of those from different localities; also specimens of different ages, or of different states of the same species. We know the name of the plant if the collection has been well determined, and are referred directly to the authors who have spoken of it. We are sure of its place of origin, as it is indicated on the label. The living plant, on the other hand, affords more opportunities for certain anatomical observations; it admits of a better description of some characters of little importance, such as color, odor, etc. But plants in the field and forest are not named, and in Botanical Gardens they are often very badly named. The geographical origin of their plants is almost always uncertain or unknown. Individuals are often modified by cultivation and by hybridation; seldom can we see fruit along with the flower; seldom numerous individuals of the same species; and more seldom still is a botanist permitted to gather sufficient specimens of an exotic plant, so that he can examine it as he would, and can preserve the evidences to substantiate his work.

When we reflect upon these differences, we are surprised to see so much lukewarmness shown by anatomists and physiologists to all that concerns Herbaria. Without their aid these gentlemen could not be sure of the name of any plants except the most common ones. They go at hap-hazard from one species to another, from one genus to another, without being advised of their affinities by classification and the view of numerous specimens, such as are to be found in a Herbarium. They can themselves testify, how much more considerable an amount of work has been done in the Herbarium than in the Gardens, and that, too, in regard to microscopic organs, such as pollen, ovules, embryos, archegonia or spores. Without Herbaria we should not have had, at this moment, either good general treatises or good floras; and published descriptions would have been without material evidences, just as are those in the works of Rumphius and Plumier, skilful naturalists though they were. It would have been just as it is with a good many of the observations made with the microscope: the elements for such observations, obtained by some happy section, have ceased to exist.

The indifference of public administrative bodies in regard to Herbaria is as extraordinary as is that of anatomists and physiologists, when we consider how small is the cost of collections of this nature, as compared with that of Gardens. This comparison has never been been made, and it is worth while to say a few words on the subject.

Leaving out of view the cost of ground and buildings, which is however insignificant for a Herbarium, but considerable for a Botanical Garden, let us look merely at the relative expense of keeping up the two kinds of collections. An extensive private Herbarium costs on an average only 3,000 or 4,000 francs a year for purchase of plants, paper and other materials, and for the salary of a custodian employed during a portion of the day. A public Herbarium of corresponding importance, more completely accessible to botanists, and consequently having more *employés*, and directed by a professor, a portion of whose salary should be charged, costs or ought to cost say 10,000 francs per annum. The great majority of public Herbaria do not cost so much; and this may be perceived from their pitiable condition. There are perhaps not ten public Herbaria in the world with resources sufficient for a proper increase, and for a good arrangement of what they have. Perhaps all the public Herbaria of the five parts of the world do not cost altogether in their present condition more than 200,000 francs a year. And yet it is with this that nine-tenths of all the good work in descriptive botany has been done, and horticulturists, anatomists and physiologists have been furnished with the means of knowing the exact names of plants, and of making those researches, for which *exsiccatae* are particularly suited.

A Botanical Garden of moderate size costs not less than 4–5,000 francs a year. Many others take 10–15,000 francs, and the extensive Gardens, which may be compared with the grand Herbaria, expend as much as 60–80 or 100,000 francs annually. Take a list of the one hundred most important Botanical Gardens, beginning with those of Kew, Paris, Buitenzorg, Calcutta, St. Petersburg, &c., then those attached to universities, and finally others in places without universities, the average annual expense would be at least 15,000 francs for each establishment, or one and a half million francs for the hundred Gardens. The total number of these Gardens being greater than one hundred, it is probable that there is expended for the keeping of living plants, a part of which die each year, nearly two million francs per annum. Deduct what is proper to be charged to the amusement of the public and the instruction of students, there still remains an expenditure five times greater than that for Herbaria, and all for a vastly inferior scientific result.*

If governments could only agree to devote to the *Hortus siccus* a portion of the sum they apply to Botanical Gardens, a singular impulse would be given to Botany. By promising, for instance, to purchase collections of *exsiccatae* from countries not yet explored, they would advance the knowledge of all the plants of our epoch, in the double point of their nature and of their geographical distribution. A few thousand francs appropriated to Herbaria, on the part of which there might be an engagement to perform a certain amount of work in the way of arrangement and of determination, would cause many an existing collection to emerge from its present chaotic condition. Anatomists, physiologists, horticulturists and directors of Botanic Gardens could at least determine plants with certainty and without too great trouble ; but, above all, authors of floras and of monographs would be able to work with good materials, and would give us fewer of those deplorable descriptions that I have characterized as enigmatical.

§ 101. **Double Flowers.**—M. Heckel, in a note to the Academy (*Comptes Rendus* Oct. 4th, p. 581) attributes the formation of double flowers, through petaloid development of the stamens, to long-continued self-fertilization. His observations have been made on *Convolvulus arvensis*, L., the flowers of which vary from deep rose-color, through white with purplish markings, to immaculate white. He regards the last named (pure white) as an example of the Darwinian idea that flowers lose their color through close fertilization. The two white varieties observed by M. Heckel were found to have a frequent tendency to be affected with petalody of the stamens. Believing this to be due to the same cause, close-fertilization, he undertook a series of experiments on the plant, extending over a period of three years. The results reached are in perfect accordance with the opinion that he had formed, the third generation of the plants giving him an abundance of double flowers. While M. Heckel's observations are important, it cannot be that double flowers are wholly due to the causes he adduces, since we have numerous examples of such among insect-fertilized flowers, of which the rose furnishes a conspicuous example.

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*The author elsewhere compares the value of plates, engravings, &c., with that of dried specimens, and gives the following statistics of their relative cost :

The number of botanical plates in existence exceeds 120,000, and they have cost at least twenty-four million francs. This is the valuation of the *stock* deposited in libraries ! Have the results been commensurate with this vast expenditure ? I will leave it to each one to answer this question according to his own ideas. But as a term for the comparison, I will add, that a very rich Herbarium, of one hundred thousand species and one million specimens, does not represent more than 3 or 400,000 francs of successive expenditures. Seven or eight hundred Herbaria, equal in size to the best twenty in existence, would represent the same cost as the plates.

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NEW AMERICAN DESMIDS.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VIII.] New York, January, 1881. **[No. 1.**

§ 1. American Fresh-Water Algae.

By FRANCIS WOLLE.

*Species and Varieties of Desmids new to Science.

(PLATE VI.)

Micrasterias Mahabuleshwarensis, Hobson, var. AMERICANA. *n. var.* (Plate VI., Fig. 1). This plant does not quite conform to the one described by Hobson. It has similar end-lobes, but the margins of the lateral ones are more like those of *M. Americana*, Ehrb. The lobes themselves are unlike; in the one they are entire, in the other they are divided into two lobules. (Cf. Figs 1 and 2.) This may be a variety referred to by Rabenhorst in his *Flora Europaea Algarum*, Vol. III., p. 196, where he says: "*M. Americanae* forma esse videtur."

Micrasterias Americana, Ehrb., var. *recta*, Wolle (Plate VI., Fig. 2). Described in BULLETIN, Vol. VI., p. 122.

MICRASTERIAS PSEUDOFURCATA, *n. sp.* (Plate VI., Fig. 3). M. magna, levis; semicellulis trilobis; lobis basalibus attenuatis, profunde incisis; lobulis plus minus divergentibus, apice bidentatis; lobo polari anguste cuneato; angulis longe sub-rectis productis; apice trifurcatis. Diam. .006″—.007″.

Hab. Ponds, New Jersey and Florida.

This form is similar to *M. furcata*, Ag., but differs in the absence of the middle lobe.

MICRASTERIAS TRIANGULARIS, *n. sp.* (Plate VI., Fig. 4.) M. permagna, orbicularis; semicellulis quinquelobis; lobo polari triangulari, lateralibus rectis vel leviter undulatis, subaequalibus, angulis, lateris in mucronem productis; lobulis et lobis intermediis aequalibus, repetito-bilobulatis; lobulis bifurcatis, angulis cum spinis curvato-divergentibus elongatis armatis. Diam. .009″—.01″.

Hab. In pond on Broadtop Mountain, Pa.

The lobules next the sinus, and next the polar lobe are not unfrequently a simple point, not bifurcate.

Micrasterias pinnatifida, Ktz. var. *inflata*, Wolle. (Plate VI., Fig. 5.) Described in BULLETIN, Vol. VI., p. 122.

Cosmarium irregulare, Wolle. (Plate VI, Fig. 6.) Described in BULLETIN, Vol. VI., p. 186.

COSMARIUM MARGARITUM, *n. sp.* (Plate VI, Fig. 7, front view; 7*a* side view; 7*b*, end view; 7*c*, zygospore with young plants attached). C. parvum, variabile, suborbiculare, modo depressum, modo ad tertiam longius quam latius; sinu anguste lineari; semicellulis suborbicularibus, ambitu undulato-crenatis, crenis lateribus plerumque triundulatis, scrobiculis basalibus modice instructis; dorso convexis nonnunquam retusis; a vertice visis ovalibus, medio ventricosis inflatis;

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*A few of these forms were described in the BULLETIN, Vol. VI., pp. 121-123, and 186, and, as figures have been asked for, they are herewith given on the accompanying Plate (Plate VI).

cytiodermate leve ut margarita nitente. Zygosporis sphaericis, spinis elongatis apice bifidis obsitis. Diam. .0009″—.001″.

Hab. Splitrock Pond, New Jersey.

This plant might pass for a variety of *C. venustum*, Bréb., or *C. Naegelianum*, Bréb., had the end no central inflation. *C. phaseolus*, Bréb. possesses the inflations, but is entire.

Cosmarium pectinoides, Wolle. (Plate VI, Fig. 8, front view; 8*a*, side view). Described in BULLETIN, Vol. VI., p. 122.

This may be a variety of *C. pulcherrimum*, Nordst. It differs from that species, however, in the more numerous radiating rows of granules.

Cosmarium dentatum, Wolle. (Plate VI, Fig. 9). Described in BULLETIN, Vol. VI., p. 122.

A fine, distinct species. It approaches *C. Brebissonii*, Menegh., but is more than twice the size. It exhibits the conical granules, like teeth, on the sides of the cells. The ends are devoid of teeth. Not infrequent in Pennsylvania and in New Jersey.

COSMARIUM DONNELLII, *n. sp.* (Plate VI, Fig. 10, front view; 10*a*, end view). C. mediocre, plerumque fere tam longum quam latum, suborbiculare, sinu anguste-lineari; semicellulis subsemicircularibus, dorso plus minus depressis, margine circiter 18 margaritis ovalibus, in series singulas, composito. Diam. et lat. .0015″—.0018″. Hab. Ponds, Florida. Collected by Capt. J. Donnell Smith, 1879.

This species comes nearest *C. monomazum*, Lund, but is a distinct form.

STAURASTRUM ODONTATUM, *n. sp.* (Plate VI, Fig. 11 front view; 11*a*, end view). St. magnum, tam longum quam latum; semicellulis a fronte visis, quadrangularibus angulis superioribus in cornu gracile elongatis, incurvis vel rectis, marginibus plus minus profunde serrato-dentatis in apicem furcatum productis; angulis inferioribus dentibus armatis, a vertice visis quadriradiatis. Diam. sine rad. 0008″—.001″; cum rad., .0016″—.003″; long, .0016″—.0018″.

Hab. Splitrock Pond, New Jersey, July, 1880.

This plant has much in common with some varieties of *St. gracile*, Ralfs, but is more robust, has quadrangular semicells, is larger, and is furnished with teeth near the sinus.

Staurastrum cuneatum, Wolle. (Plate VI, Fig. 12). Described in BULLETIN, Vol. VI., p. 123.

STAURASTRUM BOTROPHILUM, *n. sp.* (Plate VI, Fig. 13, front view; 13*a*, side view; 13*c*, end view). St. mediocre, paulo longius quam latius, distincte granulosum; granulis in series regulares ordinatis; a fronte, semicellulis triangularibus, angulis inferioribus rotundatis subito in dorsum late truncatis, a lateribus, late ellipticis divergentibus, a vertice, triangularibus. Diam. .0015″—.0016″.

Hab. Swampy places near Bethlehem, Pa.

This form belongs to a class like *St. pygmaeum*, Bréb., *St. punctulatum*, Bréb., *St. rugulosum*, Bréb., etc., but is separated by the Cosmarium-like, truncate form as seen in front view.

STAURASTRUM PRINGLEI, *n. sp* (Plate VI, Fig. 14, quadrangular-end view; 14*a*, front view; 14*b*, side view; 14*c*, triangular-end view). St. parvum, distincte granulatum, tam longum quam latum, medio plus minus constrictum ; sinu acutangulo ampliato; semicellulis subtriangularibus, lateribus rotundatis, dorso subplanis, medio convexis, subapice retusis, angulis acutis; a vertice visis tri-vel tetragonis; in forma trigona lateribus fere rectis; in forma tetragona retusis, angulis acutis. Diam. .0011″—.0013″.

Hab. Nebraska Notch, Vt. Collected by C. G. Pringle.

The form nearest to this is *St. Kjellmani*, Wille, collected in Nova Zembla, but it differs in size and in proportions of length to breadth; in having the angles acute, not rounded, and turned upward in the direction of the sides, not straight; in having triangular, not elliptical semicells; and in its back being straight, elevated in the centre, and retuse, not rounded.

STAURASTRUM DONNELLII, *n. sp.* (Plate VI, Fig. 15.) St. parvum, duplo longius quam latius, oblongo-quadratum; cytiodermate punctato et sulcato; semicellulis quadratis, angulis basalibus rotundatis, lateribus leviter sinuato-retusis; angulis superioribus (quatuor) in cornu breve obtusum divergenter productis; a vertice visis, quadrangularibus. Diam. .0006″.

Hab. Florida. Collected by Capt. John Donnell Smith.

The form nearest this plant is *St. pileolatum*, Bréb., but it differs in having the ends furnished with three conical processes, and in being triangular in end-view.

STAURASTRUM PENTACLADUM, *n. sp.* (Plate VI, Fig. 16 and 16*a*, front and end views) St. mediocre, granulato-asperum; semicellulis ventre inflatis, dorso rotundatis. angulis in cornu apice distincte trifurcatum productis; a vertice visis quinque-radiatis; radiis substrictis, margine serrato-dentata. Diam. .0015″.

Hab. Splitrock Pond, New Jersey, July, 1880.

St. gracile, Ralfs, comes near this form, but its end-view is triradiate. N. Wille, of Norway, has published a variety, *nanum*, which is quadriradiate. My plant has five arms, and the membrane is unusually rough; and, in addition, the points on the ends of the arms are very prominent and divergent.

Staurastrum grallatorium, Nordst., var. UNGULATUM, *n. var.* (Plate VI, Fig. 16.) Var. cornu in apicem aculeis singulis curvatis, similibus aquilae ungulis producto.

Staurastrum cruciatum, Wolle. (Plate VI, Fig. 18.) Described in BULLETIN, Vol. VI., p. 123.

STAURASTRUM HELENEANUM, *n. sp.* (Plate VI, Figs 19 and 19*a*, front and end views.) St. parvum, granulato-asperum; granulis in series transversas ordinatis ; semicellulis subellipticis, dorso modice convexis, ventre tumidis; angulis in cornu productis; a vertice triradiatis; radiorum basis inflatis, marginibus prominentibus apice furcatis vestitis. Diam. .0012″—.0015″.

Hab. Splitrock Pond, N. J., frequent. 1880.

There is a similarity between this desmid and *St. vestitum*, Ralfs; but, while the latter has two slender forked spines at the middle of each side, mine has stouter forked processes on the inflated base of each arm; and, in addition to this, the plant is only about half the size of *St. vestitum*.

EUASTRUM ATTENUATUM, *n. sp.* (Plate VI, Fig. 20, front view;

20*a*, side view.) E. mediocre, diametro duplo longiore; semicellulis pyramidalibus, basi dilatatis utroque margine laterali semel sinuatis, in lobum polare rectum truncatum attenuatis; apice crenato-rotundatis; lobo polari uno et lobo basali duobus vel tribus tumoribus instructo; cytiodermate subtillissimo punctato. Diam. et lat. .0013″, long. .0026″.

Hab. Ponds near Bethlehem, Pa.

DOCIDIUM SPINULOSUM, *n. sp.* (Plate VI, Fig. 21, a semicell.) D. valdidum spinulosum subcylindricum undulatum octies—decies longius quam latius, medio valde constrictum; semicellularum stricturis margine 3–4 plus minus prominentibus, modice attenuatis; cytiodermate dense spinifero; spinulis apicis rotundatis duplo majoribus aliis. Diam. .0016″—.0018″.

Hab. Pond, Dennisville, N. J., July, 1880.

Pleurotaenium nodulosum, Bréb., *Docidium hirsutum*, Bailey, and *D. nodosum*, Bailey, have features in common with this form. I separate it because of the armor of spines with which it is clothed. These are not hairs—not gelatinous contractions, but decided spines, and those of the ends of the cells are longer and stronger than those on the body of the cell.

§ 2. New or Little-Known Ferns of the United States. No. 9.

28. CYSTOPTERIS MONTANA, Bernh.—When I had occasion to describe this fern in the "Ferns of N. America" it had not been found anywhere in the United States, the American range being from Labrador to the Rocky Mountains of British America. In Rothrock's report I ventured to say that it might possibly occur in California or Colorado. Last summer it was found in Colorado by Mr. T. S. Brandegee, on the Mt. Antero Spur of the Sawatch Range, at 10,400 feet above the sea. Mr. Brandegee writes that "two colonies of it grow there twenty feet apart in damp moss about the roots of *Abies Engelmanni*." The fern has a very slender creeping rootstock, and the scattered fronds are from three to five inches long, broadly ovate-pentagonal in outline, and very delicately three to four times pinnate. The species occurs in the mountains of Europe, from Scotland and Norway to the Appenines and the Carpathians

29. ASPIDIUM ACULEATUM, var. PROLIFERUM, Wollaston (*sub Polysticho angulari*). This is the most delicate and finely divided form of the species; a large frond of it is figured on plate 13 of Moore's "Nature-printed Ferns." The character given by Moore reads thus: "Fronds lanceolate, lax, bi- or tri-pinnate; pinnules narrow, attenuated, distinctly stalked, usually deeply lobed with the lobes widely separated; proliferous on the rachis." This form has been found in two or three places in England, and is very common in cultivation. Not long ago it was sent me from Chicago marked "Californian." I learn that it was found in company with a narrow form of the less divided var. *lobatum* by Mrs. A. E. Kent, of San Rafael, who writes that "it is very abundant in the southern part of California, and is commonly called "San Diego fern." It is somewhat strange that none of the San Diego botanists has sent it here; but now that it is reported it is to be hoped they will search for it.

The great delicacy of the very narrow ultimate pinnules will render its identification easy. I have noticed no proliferous buds on the Calfornian specimens, but otherwise they are precisely like the cultivated plant.

30. PELLAEA ANDROMEDAEFOLIA, var. PUBESCENS, Baker.—This form, incidentally mentioned in the "Ferns of North America," is very rare in collections. It has been found near San Diego by Prof. Wood; in the mountains near "Live-Oak Creek" by the botanists of the Mexican Boundary Survey; and recently, on the San Francisco Mountain, in Arizona, by Rev. E. L. Greene. Mr. H. H. Rusby has also collected it somewhere in Arizona or New Mexico, and through an error of mine has distributed it as *P. flexuosa.* In general, the pinnules are larger than in the smooth forms of *P. andromedaefolia*, and often more cordate; the rachises are finely pubescent and almost glandular, and the frond shows such an approach toward the characters of *P. flexuosa* that one might easily be in doubt to which species a specimen should be referred. The real *P. flexuosa* has the primary pinnae more or less deflexed, often very much so, and occurs with the rachis either smooth or pubescent.

New Haven, Dec. 13, 1880. D. C. EATON.

§ 3. **A New Asclepias from Arizona.**—In the early days of September, 1880, while enjoying a botanical excursion among the San Francisco Mountains, in the extreme eastern part of Arizona, I noticed growing among the rocks, under the pine trees, clumps of a bush which I should certainly have passed by as mere pine bushes, but for the fact that they bore, toward the extremities of their pine-leaved branches, the follicles of a silkweed. I gathered into my portfolio a goodly number of these follicle-bearing branches, on one of which I was glad to notice a few undeveloped and withered flower-buds. Carefully preserving these, I afterwards soaked them out and found this remarkable shrub to be a genuine *Asclepias.*

On revisiting the locality, on the first day of November, I was surprised to find the bushes enjoying a second season of flowering. The species appears to be most nearly related to *A. Linaria*, Cav., of Central and Southern Mexico; but it differs from that altogether, in floral character, as also in habit, being wholly shrubby and strictly evergreen, and the leaves persisting, as in many pines, until the autumn of the second year. In November, 1880, the leaves which had put forth in the spring of 1879, were yellow and ready to fall; all the rest were bright and firmly persistent. The woody stems, even to near the base, bear the scars of the fallen foliage of preceding years, just as do the branches of pines. The half hardened wood of the present year's growth has the milky juice of the genus in general; but it is not found in the older wood. I append to this record of its discovery, the specific character of this most interesting new species, with the name which its appearance most readily suggests.

ASCLEPIAS PINIFOLIA.—Stems three feet high, branching, slender and shrubby, the young branchlets somewhat puberulent; evergreen leaves alternate, much crowded, narrowly linear, an inch or more long, with revolute margins and ending in a sharp callous point; umbels rather few, on peduncles much shorter than the leaves, and of about equal length with the pedicels; corolla-lobes oblong, white with greenish tips; hoods white, spatulate-oblong, twice the length of the anthers, with a straight, thick, obtuse, moderately exserted horn; anther-wings very broad and conspicuous for the size of the flowers, and minutely notched at the base; column short, but distinct; follicles smooth, ovate, with rostrate-attenuate apex.

Silver City, New Mexico. EDWARD LEE GREENE.

§ 4. **New Stations for Tillandsia.**—It may possibly not be generally known to botanists that the "long moss," *Tillandsia usneoides*, L., grows on the peninsula of Eastern Virginia; at least I have seen no record of its occurrence north of the Dismal Swamp. In crossing the peninsula from Cherrystone to Cobb's Landing, this southern parasite may be seen growing at two or three stations, about half way across; in one place festooning the top of a rather tall holly (*Ilex opaca*) directly by the roadside, and at another, wreathing the trunks of the large pines (*Pinus australis?*) One "streamer" of at least twelve feet in length was observed. I was informed by an intelligent inhabitant of the town of Capeville that it extends to the northern limit of Northampton County, or to about the 38th parallel of North latitude.

Washington, D. C. R. RIDGWAY.

§ 5. **New Finds for New England.**—A new station for *Polemonium caeruleum*, L., was discovered a few years since in the Green Mountains. It is in the town of Ripton, Vt., at a small pond 1,500 feet above sea-level, and over a mile from any house or clearing. Nearly an acre of the boggy delta of a small brook was covered with thousands of these bright blue flowers.

In August, 1879, I discovered a few specimens of *Zygadenus glaucus*, Nutt., growing on the north side of a steep rocky headland of Lake Champlain, near the mouth of Otter Creek.

Carex, Grayii, Carey, *C. flexilis*, Rudge, *C. formosa*, Dew., and *Juncus Canadensis*, J. Gay, var. *brachycephalus*, Engelm., I find in the vicinity of Middlebury, Vt. They have not, I think, been reported from this region before.

Middlebury, Vt. EZRA BRAINERD.

§ 6. **Similarity between the Lichen Flora of Africa and South America.**—Dr. J. Müller, of Geneva, Switzerland, in describing a recent collection of Lichens from the western coast of Africa, calls attention to the remarkable fact that although there is little in common between the phaenogamous floras of that coast and the eastern coast of South America, yet out of 40 previously known *lichens* in this collection 32 also occur in South America. More than half the entire collection, of 60 species is common to both continents. He attributes this to the strong aerial equatorial current which blows steadily from east to west, and can transport such light bodies as the spores and soredia of lichens from Africa to America, while the seeds of plants are too heavy to be transported in this way. He observes that this means of dissemination renders it necessary to be strongly on guard against describing a lichen as new; and that the same facts in regard to distribution prevail among the fungi, mosses and other of the lower plants, as among the lichens. This coincidence with reference to the *Characeae*, between America and Asia, was noticed by Dr. Allen in the October number of the BULLETIN. It might be interesting to attempt to trace it also between Western Africa and Eastern Asia.

H. W.

§ 7. **What is a Frond?**—Some pteridologists insist on limiting the idea of a frond to what would be the lamina in an ordinary leaf, but the popular idea embraces both stipe and frond. Even botanists, usually critical when referring to ferns, sometimes relax the rigid rule and take in the stalk and all when speaking of palms. I sympathize somewhat with the popular view. We have a double meaning for the ordinary leaf, and why not for the "leaf" of the fern? If a student be asked to describe a leaf he rightly tells of the lamina, the petiole and the stipules. If we read that a plant has the peduncles longer than the leaves, we do not understand that comparison is limited to the leaf-blade alone. Indeed, the very term "leaf-blade" involves the idea that something else than "blade" is wanting to make the idea perfect. Yet, when we come to describe a leaf in its stricter sense, we say it is coriaceous, or serrate, or ovate, and we understand that we then limit the idea to the lamina alone. Why cannot we rightfully have the same duplex idea in pteridology? Indeed, the classical *frons* was certainly not limited to the green blade, nor does it seem probable that it was so intended when introduced into botanical language.

THOMAS MEEHAN.

§ 8. **Notes on the Middlesex County, N. J., Flora.**—The following are new stations for a few somewhat rare plants detected in Middlesex Co., N. J.: *Scutellaria integrifolia*, L., at South Amboy; *Quercus Phellos*, L., at South River; *Euphorbia corollata*, L., and a number of pine barrens plants at Burt's Creek; *Orontium aquaticum*, L., and *Habenaria blephariglottis*, Hook, at Sayreville; *Podophyllum peltatum*, L., at Perth Amboy; *Echium vulgare*, L, in great abundance, *Stylosanthes elatior*, Swartz and *Bromus sterilis*, L., at New Brunswick. The *Echium* occurs all along the track of the Pennsylvania Railroad, from Jersey City westward.

Prof. Geo. H. Cook reports the occurrence of *Lygodium palmatum*, Swartz, at Craner's Mills, just south of New Brunswick, and of *Xerophyllum asphodeloides*, Nutt, about three miles south of the same place. These localities are rather extra-limital as regards the Torrey Catalogue, but are nevertheless worthy of record. This is the most northern point at which the *Xerophyllum* has been found in New Jersey.

N. L. BRITTON.

§ 9. **Contributions toward a List of the State and Local Floras of the United States.**—ADDENDA TO PART I.

Since the publication of our first list we have discovered a few more catalogues, and, through the kindness of correspondents, have had communicated to us the titles of still others relating to the flora of

THE EASTERN STATES.

*List of the Seaweeds or marine Algae of the south coast of New

England. By W. G. Farlow, M.D. (B).
In Reps. U. S. Fish Commission, Washington, 1871 and 1872.

MAINE.

List of Plants noticed in the Maine woods in the years 1853 and 1857. By H. D. Thoreau. (B).
In Appendix to "Maine Woods," Boston, 1866.
*List of marine Algae collected near Eastport, Me., in August and September, 1872, in connection with the work of the U. S. Fish Commission under Prof. S. F. Baird. By Daniel C. Eaton. (B.)
In Trans. Connec. Acad. Sci. Vol. ii., New Haven, 1873.

MASSACHUSETTS.

List of the native Trees of Massachusetts, with notes upon certain naturalized species. By F. B. Hough.
In Rep. on Forestry, pp. 406–416, Washington, 1877,
†*Essex County.*
Studies of the Essex Flora; a complete enumeration of all Plants found growing naturally within the limits of Lynn and the towns adjoining. By C. M. Tracy. (B). 8vo. pamph. pp. 87. Lynn, 1856.
Woody Plants of Essex County; a list of Trees and Shrubs naturally growing in the County, and of those extensively introduced. By John Robinson. (B). In Bullet. Essex Inst., Vol. xi. Salem, 1879.
Trees and Flowers of Cape Ann, by Calvin W. Pool, and of Pigeon Cove and vicinity, by Henry C. Leonard. (A). Boston, 1873.
Flora of Georgetown, Mass. By Mrs. C. N. S. Horner. (A).
Pub. in Georgetown *Advocate*, Feb. and Mar., 1876.
Flora of Essex County. (Includes Phaenogams, vascular Cryptogams, Lichens, Mosses, Hepaticae, Characeae, and marine Algae with extensive notes, and historical preface and sketch of early Essex County botanists). By John Robinson.
Pub. by Essex Institute, 8vo., pp. 170, Salem, 1880.

RHODE ISLAND.

Algae Rhodiaceae. A list of Rhode Island Algae. By Stephen T. Olney. (B). In Lens. Vol. i., Chicago, 1872.
Contributions toward a complete list of Rhode Island Diatoms. By S. A. Briggs, (addition to Olney's catalogue).
In Lens. Vol. ii., Chicago, 1873.

W. R. G.
N. L. B.

§ 10. **Botanical Notes.**—*Influence of Altitude on Colors of Flowers.*—M. Gaston Bonnier, according to *La Nature*, has recently been making observations in Austria and Hungary on the modifications exhibited by the same species of plants at various altitudes, and his researches have especially been directed towards the differences shown in the coloration of flowers. A comparison of the tints of a large number of species in two, three, four and sometimes five localities of increasing altitude has shown a notable deepening of the color with the increase in height of the station. This variation was found to be remarkably pronounced in *Myosotis sylvatica*, *Campanula rotundifolia*, *Ranunculus sylvaticus*, and *Galium cruciatum*; but, on the contrary, not well shown in *Thymus Serpyllum* and *Geranium sylvati-*

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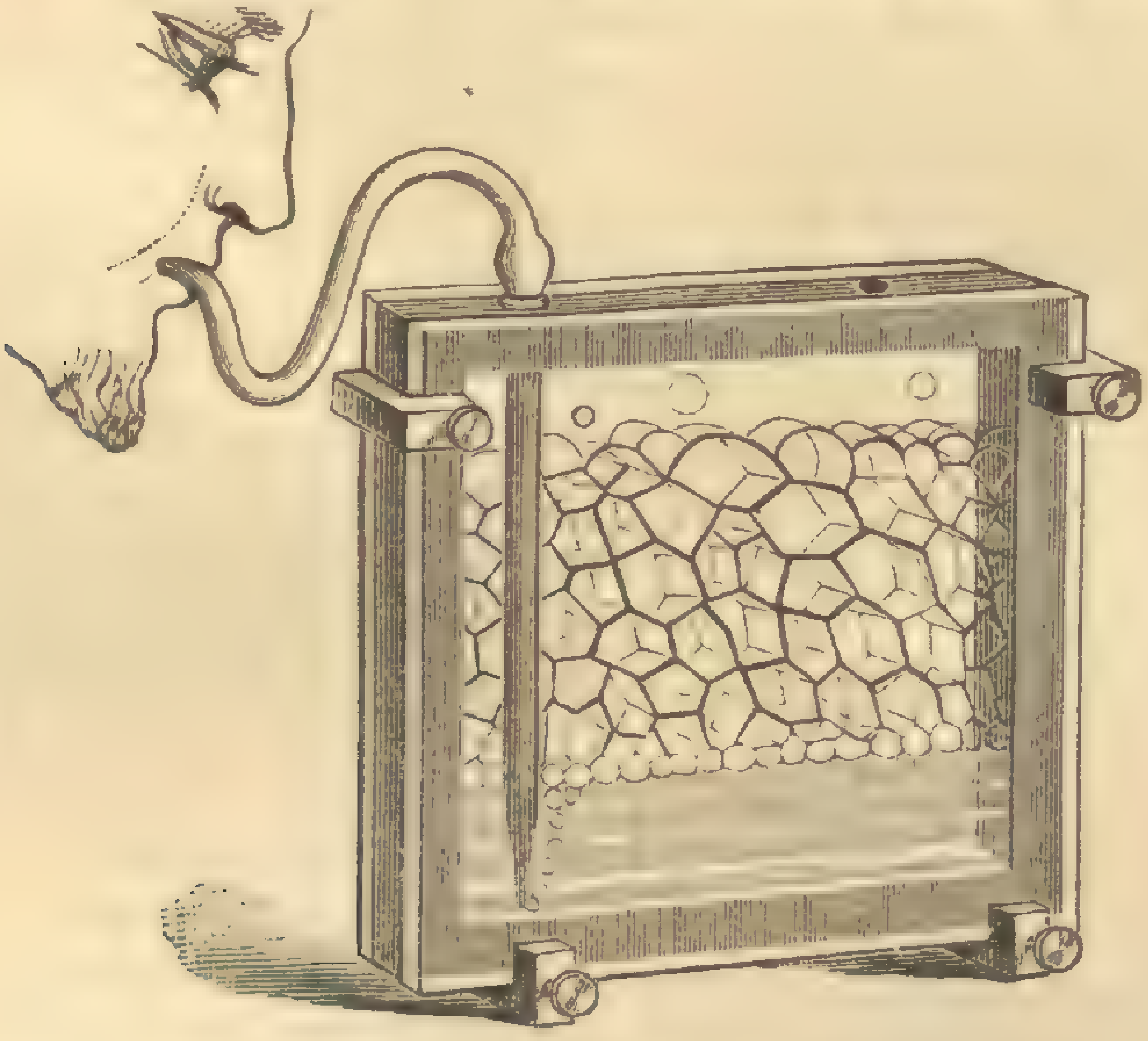
*Communicated by Mr. F. S. Collins.
† " " Mr. John Robinson.

cum. In proportion as we ascend, a rosy color is quite frequently seen in such flowers as are, at lower stations, ordinarily pure white or nearly colorless, such as *Silene inflata*, *Silene rupestris*, *Bellis perennis*, etc. A microscopic examination made on the spot, in several cases, showed that the increase of color was not due to a change in the distribution of the coloring matters, but to an increase in the number of the granules of the pigment in a given surface. It has been shown that, in consequence of the purer atmosphere and the less quantity of aqueous vapor, solar radiation on mountains increases with the altitude ; and the production of coloring matters would seem to vary in the same direction. Although the amount of such variation is very different in different species, M. Bonnier has drawn from his observations the conclusion that "in the same species the coloration of flowers of equal age increases in general with the altitude, all other conditions being equal."

"*Fool's Parsley*" *not Poisonous.*—For several centuries the plant *Æthusa Cynapium*, L., has been the object of suspicion, and classed among poisons by botanists and toxicological writers. But now Dr. John Harley, of England, comes forward and presents a vindication of what he call "an innocent and harmless plant." In the St. Thomas' Hospital Reports he relates a number of facts to prove the correctness of his conclusions. The juices of the plant, from the root as well as from the leaves, were obtained by expression just before flowering, and also after the plants had reached maturity and set fruit. Being thus provided with a supply of material representing the active properties of the plant, he exhausted it upon four patients, one a little girl 4 years old, who took the extract in quantities ranging from 2 drachms to 2 ounces ; himself, who took it in quantities ranging from 2 to 4 fluid ounces ; and two other adults, who were the subjects of spasmodic wry-neck. These two took one or other of the juices in doses ranging from 1 to 8 fluid ounces. Effects were anxiously looked for, but absolutely none followed in any of the cases. Dr. Harley therefore feels compelled to assert that *Æthusa Cynapium* of Sussex, Essex, Kent, Surrey and Hertfordshire is not only absolutely free from the noxious properties attributed to it, but that it is pleasant to sight, smell and taste, and, in the absence of the more fragrant and succulent plants, might well be used as a pot-herb or salad. He is satisfied further, that his conclusions are independent both of locality and season, and that the only influence which these conditions have on fool's parsley, as on hemlock (*Conium maculatum*), is to increase or diminish its succulency. Dr. Harley some years ago made some observations on the last-mentioned plant, and came to the same conclusion in regard to its innocuous nature that he has concerning that of the *Æthusa*. In connection with this it may be stated that *Conium maculatum* in northern latitudes—Russia for example—is eaten with impunity, although precaution is taken to first boil it in several waters. This subject of the harmlessness under certain conditions of plants reputed to be poisonous, recalls to mind the statement of Linnaeus, in his *Flora Lapponica*, that the Norlanders prepare from the leaves of *Aconitum Napellus* a broth, which they eat without any injurious effects resulting therefrom.

New Illustration of Cell-Formation.—Mr. D. S. Holman, of Philadelphia, has recently devised a very neat and simple apparatus, useful to teachers, whereby the method of formation of cells in vegetable structure may be conveniently shown to an audience. It consists merely of a tank formed of two pieces of plate glass, held apart at the bottom and sides by a rubber strip and kept in place by four clamps. Into this receptacle is poured a solution of soap, which is raised in bubbles by a current of air blown into it through a fine glass tube. As the bubbles are formed, their tendency to become spheres is overcome by the capillary attraction of the sides of the tank. As a natural consequence, the films extend across the tank perpendicular to the walls, and the pressure of one bubble upon another causes the formation of polygonal forms, analogous to those which we see in cross-sections of wood-fibre. The accompanying figure, which we borrow from the *Journal of the Franklin Institute*, gives an idea of the appearance presented by the tank when thus filled with bubbles, but gives no conception, it is said, of the beauty of the projection of it which may be made upon a screen. The pencil of rays passing from the condensing lens of a stereopticon is convergent; and, as a consequence, many rays fall upon the soap films at such a large incident angle that they are almost entirely reflected, and consequently are tinged with the rich colors resulting from the interference of the rays that fall on thin films. We thus have before us a proof of the tenuity of a layer which is between the limits of 1–17000th and 1-15000th of an inch—the latter limit being reached when the color of the film disappears. The same illustration also affords an exemplification of the principle (shown in Nature in the structure of the honey-comb) that the pressure of equal circles on each other produces a hexagonal structure.



Cornell University.—We learn from the daily papers that the Botanical Department of Cornell University has recently been the recipient of a gift of ten thousand dollars from the Hon. H. W. Sage, of Ithaca.

§ 11. **Botanical Literature**.—Trimen's *Journal of Botany* for December contains 'Musci Praeteriti,' by Richard Spruce; 'Enumeratio Acanthacearum Herbarii Welwitschiani Angolensis,' by S. LeM. Moore; 'Ile of Wight Plants,' by Rev. W. M. Rogers; and 'Collection of Ferns from Madagascar,' by J. G. Baker. To judge from the editor's remarks at the close of the volume, English botanists are slow to give journals devoted to their specialty that cordial support that they should. We regret to learn that the *Journal*, as old as it is, and the only one of its kind in England, "is still in need of financial support, and that additional subscribers, as well as contributors," are wanted.

In *Grevillea*, for December, the editor sharply defends his specialty against the incursions of Mr. Saville Kent, who, in his recent work on *Infusoria*, has attempted, as others have done before him, to rob Mycology of the *Myxogastres* and transfer them to the animal kingdom. Mr. Chas. B. Plowright gives an interesting account of spore diffusion in the larger Elvellacei, and Mr. Greenwood Pim contributes a valuable 'Index to the British Fungi described or noticed in *Grevillea*, Vols. i.—viii.'

The *Botanical Gazette* for December has an interesting account of a 'Summer on Roan Mountains,' by Prof. J. W. Chickering; an account of some experiments with 'Carnivorous Plants,' by W. K. Higley; 'Notes from Utah,' by Marcus E. Jones; and a description of a new species of *Nabalus* (*N. Roanensis*), by Prof Chickering.

To the *American Naturalist* for December, Prof C. E. Bessey contributes an interesting 'Sketch of the Progress of Botany in the United States in the year 1879.' In the department of Botanical Notes (which we are pleased to learn will hereafter be edited by Prof. Bessey), L. P. Gratacap gives a list of plants observed by him growing spontaneously last summer in Manhattan Square, New York City, and W. W. Bailey, in the same place, describes and illustrates a case of dispermy in *Quercus Prinus*.

The *American Monthly Microscopical Journal* for December contains a short article by William Farnell on 'Plants (insectivorous) in Florida.' The editor announces that during the present year the subject matter of the *Journal* will be increased by the substitution of smaller types for those heretofore in use, the number of pages remaining the same. This periodical contains matters of interest to nearly all botanists, and should receive their support.

Erie Natural History Society.—This is a historical sketch of the Society, with the Constitution and By-laws, a list of members and a few of the papers read before the association. The members are divided into two classes—those who contribute, and those who work; the fees from the latter being of course smaller. The active members are again divided into four sections, corresponding to branches of the Natural Sciences, viz: Geology and Mineralogy, Botany, Zoology and Chemistry. Of the five papers published, two are botanical. Mr. G. Guttenberg is President and Miss Sarah Madole Corresponding Secretary for 1880.

Erie, Pa., *vivat!*

§ 12. **Proceedings of the Torrey Club.**—The regular meeting of the Club was held at the Herbarium, Columbia College, Tuesday evening, December 14th, the President in the chair, and sixteen members and five visitors present.

Dr. T. F. Allen presented to the Club's herbarium Fasc. I. of *Characeae Americanae Exsiccatae*, and made a few remarks on the structure, classification, and past and present history of this order of cryptogams.

Dr. T. F. Lucy remarked on a few New York plant-stations. In Gray's Manual it is stated that *Hydrangea arborescens*, L. grows on "rocky banks, New Jersey to Illinois and southward," but Dr. Lucy had found it at two stations in the town of Ashland, Chemung County, New York, one of these being rocks at the Wellsburg Suspension Bridge, and the other a cool ravine called "Hog Hollow," at a mile or a mile and a half west, on the north bank of the Chemung River. He had also detected in 1879 two specimens of *Platanthera Hookeri*, Torr., on the top of Sullivan Hill, in the same township and county.

The President exhibited a series of beautiful thin sections of silicified tree ferns and conifers, remarked upon their structure, and pointed out the difference between these and some of their representatives of the present day.

Heterophylly.—Mr. Britton showed specimens of *Desmodium paniculatum*, DC., in which, while some of the leaflets were of the normal lanceolate form, others were orbicular like those of *D. rotundifolium*, DC.

The Herbarium.—The Chairman of the Herbarium Committee reported that 650 specimens of plants had recently been mounted and properly arranged in the case.

On motion, the President appointed a committee of three to prepare a ticket containing the names of officers and committees to be balloted for at the annual meeting in January.

§ 13. **Necrology.**—We regret to announce to our readers the death, on the 4th inst., at his residence in West Farms, New York, of Prof. Alphonso Wood, whose name is widely known throughout the United States, not only in connection with his text books on Botany, but also from his extensive and genial correspondence with lovers of his favorite study. Prof. Wood was an old and valued member of the Torrey Botanical Club, whose meetings he seldom missed, and to whose members he had endeared himself by his kindliness and his amiability of character. A more extended notice will appear hereafter.

We regret, also, to learn of the death of Dr. S. B. Mead, which occurred at his residence in Augusta, Illinois, Nov. 11th, 1880.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VIII.] New York, February, 1881. **[No. 2.**

§ 14. **The Fertilization of Alpine Flowers.**—In a newly-published, large octavo volume of 612 pages,* Dr. Hermann Müller makes us acquainted with his observations on the relations between Alpine flowers and insects, many of which, as well as some of the more important of his conclusions are already known to readers of *Nature*, *Kosmos*, etc. After describing the individual peculiarities of 422 species of phaenogams (the descriptions being supplemented by many excellent figures such as characterize his earlier work—the *Befruchtung der Blumen*), and enumerating the insects found on each; the author considers at length the significance of these peculiarities; discusses the adaptations of flowers to insect visits and the extent of these visits; the adaptations of insects for floral activity; and the variability of Alpine flowers; and makes an extended comparison of Alpine flowers with those of the lowland.

Much that is interesting might be culled from this part of the work, but we must content ourselves with a very few extracts. As was to be expected, the author finds that everywhere, even to the limit of phaenogamous life—the line of perpetual snow—the rule holds that cross-fertilization, constant or occasional, is provided for in every species, so that not a single flowering-plant is known which is incapable of being crossed at sometime. A series from the simplest anemophilous flower, whose only attraction to insects lies in its pollen, to the most highly adapted bee or butterfly flower, with fragrance, attractive form and coloration, and nectar, is fully traced and illustrated by many examples. A valuable feature of the work is the large number of comparative tables, which bespeak a great amount of labor on the part of the author, and enable the reader to see at a glance, relations which, without this aid, would require much study for their detection. These show very clearly that as flowers ascend in the scale of development, their visitors, though often decreasing in actual number of species, become limited more and more to certain groups whose floral activity is great, and from whose visits they receive the greatest profit.

In spite of the frequently-recorded scarcity of insects at high altitudes, under some conditions, the author says: "I have not been able to convince myself that, in the Alps, flowers as a whole are relatively less visited and crossed by insects than in the lowland." This results partly from the consolidation of vegetation into veritable flower-gardens—a circumstance very favorable to insect visits anywhere; and it is found that while, in the pleasantest weather, a moderately cool breeze suffices to quickly drive the insects under shelter, a quiet, sunny day, coming suddenly after several cold and rainy ones, brings them out in great abundance, their enforced conceal-

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***Alpenblumen, ihre Befruchtung durch Insekten, und ihre Anfassungen an dieselben.* (Engelmann, Leipzig, 1881.)

ment and fast having whetted their appetites and rendered them exceedingly active in their visits to the flowers. This is strikingly illustrated by the fact that 1877, which was cold, damp and rainy, but besprinkled with quiet, warm days, was not less productive of observations than the preceding summer, when, for weeks together, there was scarcely a cloud overhead. So while one day there may not be an insect visible, the next may witness them in such abundance that, as the writer expresses it, one could wish for twenty eyes and hands that nothing might escape him.

From a table showing the abundance and activity of the different orders of insects, it appears that in ascending the mountains the relative number of Coleoptera and Hymenoptera decreases, while that of Diptera and Lepidoptera increases. Thus, in the lowlands, of every 100 flower-visiting insects, 15.3 are Coleoptera, and 30 Diptera, while 43.6 are Hymenoptera, and but 9.3 Lepidoptera; but above the timber line, with 6.8 per cent. of Coleoptera, we have 43.6 per cent. Diptera, and with 18.3 per cent. of Hymenoptera, 30.7 per cent. of Lepidoptera. This renders intelligible the great abundance of narrow and partly-closed flowers, and of those which, like many species of *Saxifraga* and *Veronica*, are especially attractive to *Syrphidae* and other Diptera; whereas, without a knowledge of the relative distribution of the flower-frequenting insects it would be a hopeless riddle.

The author has followed the excellent plan, adopted in his earlier book, of compiling a systematic index to the insects observed, connecting with each species the flower it frequents and the degree of their adaptive development. It is to be regretted, however, that, in the alphabetical index to the plants observed, he refers only to the page on which their flowers are described and their visitors noted, and not to the places where they receive mention in the chapters devoted to generalization and conclusions, since numerous biological notes of value occur in these latter places.

Cambridge, Mass., Jan. 11, 1881. WILLIAM TRELEASE.

§ 15. **The Preservation of Pileate Fungi for the Herbarium.**—As well known to those who have studied the Fungi and have had some experience in attempting to preserve them for purposes of future reference, the most difficult kinds to manage are the fleshy pileate species commonly called "toadstools." A great number of experiments have been made from time to time with a view to discover some plan by means of which the forms and colors of these short-lived plants might, like those of other cryptogams and the phaenogams, be retained for an indefinite period ; but the results attained thus far have not proved in all respects satisfactory. In 1794, Dr. William Withering communicated to the *Transactions* of the Linnaean Society (Vol. ii., p. 263) a paper entitled "A new Method of Preserving Fungi," and in which he recommends that the specimen be immersed temporarily in a "pickle" consisting of an aqueous solution of sulphate of copper or of acetate of zinc, and afterwards be permanently kept in hermetically-sealed glass jars filled with water mixed with a small percentage of alcohol. In the first volume of his *Arrangement of British Plants*, this author gives us an improvement on his original recipe, based on further experimentation, but the materials employed are the same as before. He claims that by his method "fungi may be preserved pretty well." Since Dr. Withering's time various other solutions of chemicals, such as those of sulphate of zinc, chloride of sodium, sulphite of sodium, salicylic acid, etc., as well as various liquids other than alcohol, such as glycerine, petroleum, benzine, etc., have been tried and recommended for a like purpose, only to be finally abandoned as worthless. A good liquid preservative of the higher fleshy fungi still remains a *desideratum*. Another method of preserving these plants is described in a work* by Lüdersdorf, whose plan, very briefly stated, is to slightly dry the toadstool and then immerse it in melted mutton-suet at a temperature of from 125° to 130° F. After the tissues of the fungus have been thoroughly permeated by the fat, the specimen when hard is mounted on a pedestal and kept under a glass shade or in a case. The author claims that "fungi prepared in this manner preserve the exact shape and color of the living individual"; but Dr. Klotzsch (Hooker's *Botanical Miscellany*, Vol. ii.) denies this statement *in toto*. No better results, either, seem to have followed the plan of first immersing the fungus in alcohol and then in "soluble glass" (silicate of potash or soda). The specimen thus prepared becomes almost as hard as stone and speedily loses its color, whatever be the care exercised by the operator. The only person who appears to have successfully solved the problem of preserving fungi with the exact form and color that they possessed in a living state is Mr. J. English, a naturalist at Epping, England. The specimens prepared by this gentleman are said to preserve their original characteristics and natural size perfectly, and have received the approval of Dr. Hooker and other distinguished botanists. As Mr. English prepares his specimens for sale he has deemed it prudent to withhold the secret of his method of operating, and all that is known about it is contained in a short note by him in the *Transactions* of the Botanical Society of Edinburgh, and in which he merely states that the fungi are preserved by *waxing* them.

However successful may be any mode, such as the foregoing, of preparing fungi, it is obvious that specimens so preserved are fit only for the purposes of museums or other establishments where a large amount of space is available for displaying them; and for this reason the ordinary mycologist finds himself obliged to have recourse to the simple method employed for other plants—that of drying them for the herbarium. The most satisfactory mode of making good herbarium specimens of the fleshy *Agaricini* and *Boleti* is the oft-quoted one pointed out by Lasch in *Linnaea*, Vol. v., 1830, and by Klotzsch in Hooker's *Botanical Miscellany*, Vol. ii., 1831. This method, in the form left by its authors, yields very fair results in a goodly number of cases, while in some it proves a total failure. After eight years of experimentation, however, Herr G. Herpell, of St. Goar, has finally

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***Das Auftrocknen der Pflanzen fürs Herbarium und die Aufbewahrung der Pilze nach einer Methode, wodurch jenen ihre Farbe, diesen ausserdem auch ihre Gestalt erhalten wird.* Berlin, 1827.

succeeded in so modifying this method that the prepared fungi exhibit and retain for an indefinite period the size, form, color and all other essential characteristics of the living plant; and, carrying his experiments still further, he has discovered a method of fixing the fallen spores durably on paper so that collectively they form a perfect negative of the gills in the case of an Agaric or of the pores in the case of a Boletus, and exactly imitate a fine engraving. European mycologists who have seen these preparations state that the specimens, from every point of view, leave little to be desired. The full details of this new process were generously made known by its author last year in a paper read before a German scientific society, and were afterwards published in its proceedings.* A copy of this publication having come into my hands, I propose in subsequent numbers of the BULLETIN to publish a translation (perhaps somewhat condensed) of Herr Herpell's paper for the benefit of those who may not have access to the original. Having, with these few preliminary remarks, introduced the author, I shall hereafter allow him to speak for himself.

W. R. G.

§ 16. **Contributions toward a List of the State and Local Floras of the United States.** (VIII-7)

II. THE MIDDLE STATES.

Flora of the Northern and Middle Sections of the United States, north of Virginia. By John Torrey, M.D. (D.)
1 vol. 8vo. Albany, 1819.

Compendium of the Flora of the Northern and Middle States; containing generic and specific descriptions of all the Plants, exclusive of the Cryptogamia, hitherto found in the United States north of the Potomac. By John Torrey, M.D. (D.)
12mo, pp. 403. New York, 1826.

Botany of the Northern and Middle States, north of Virginia. By L. C. Beck, M.D. (D.)
12mo, pp. 471. Albany, 1833.

Musci Appalachiani; tickets of specimens of Mosses collected mostly in the Eastern part of North America. By C. F. Austin. (C.)
8 vo, pamph. pp. 92 (Supplement I, 16 pp.) Closter, 1870.

NEW YORK.

Catalogue of Plants indigenous to the State of New York. By Jacob Green. (A.)
In Trans. Soc. Promot. Useful Arts. Albany, 1814.

Catalogue of the Medicinal Plants, indigenous and exotic, growing in the State of New York. By Charles A. Lee, M.D.
8vo, pamph. pp. 64. New York, 1840.

Catalogue of the Plants of the State of New York, of which specimens are preserved in the Cabinet at Albany. By John Torrey, M.D. (A.)
In 2d Ann. Rep. of Regents on Cabinet. Albany, 1849.

Catalogue of Plants indigenous to the State of New York. (Ranunculaceae to Melastomaceae). By John Torrey, M.D. (B.)

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* *Verhandlung des naturhistorischen Vereins der preussischen Rheinlande und Westfalens.* IV Folge. 7 Jahrgang. Bonn, 1880.

In 3d Rep. Geolog. Survey of State. Albany, 1839.

Catalogue of Plants of New York State. By John Torrey, M.D. (B.)

In 4th Rep. Geolog. Survey of State. Albany, 1840.

Flora of New York State. By John Torrey, M.D. (D.)
2 vols. 4to. Albany, 1843.

Botany of New York, or the New York Flora. By John Torrey, M.D. (A.)

In Catalogue of Cab. Nat. Hist. N. Y. Albany, 1843.

List of Plants described in the State Flora; and of Plants discovered and collected since the publication of the Flora. By John Torrey, M.D. (A.)

In 6th Ann. Rep. Regents on Cabinet. Albany, 1853.

*List of Plants growing spontaneously in the State and not included in Torrey's Catalogue. By G. W. Clinton. (B.)

In 18th and 19th Ann. Rep. Regents on Cabinet. Albany, 1865–66.

List of Mosses of the State of New York. By Charles H. Peck. (C.)

In 19th Ann. Rep. Regents on Cabinet. Albany, 1866.

List of the Ferns of New York State. (A.)

In Bullet. Tor. Bot. Club. Vol. vi. 1878.

Cayuga County.

Catalogue of the Plants found in the vicinity of Aurora, 1840. By Alexander Thomson, M.D. (A.)

In 54th Ann. Rep. of Regents. Albany, 1841.

Chautauqua County.

The Chautauqua Flora. By Edward S. Burgess. (A.)
8 vo, pamph. pp. 38. Clinton, 1877.

Columbia County.

Catalogue of the indigenous Plants found growing in the vicinity of Kinderhook Academy. By W. V. S. Woodworth. (A.)

In 52d and 53d Ann. Rep. of Regents. Albany, 1839–40.

Delaware County.

Plants collected by the botanical class in the Delaware Literary Institute during the summer of 1840. By M. Platt. (M.)

In 54th Ann. Rep. of Regents. Albany, 1841.

Duchess County.

Catalogue of the phaenogamous and acrogenous Plants growing without cultivation within five miles of Pine Plains. By Lyman Hoysradt. (B.)

Supplement to Bullet. Torrey Club. 8vo, pp. 32. New York, 1878–79.

List of Plants of Fishkill and its vicinity. By Winifrid A. Stearns. (B.)
16mo, pamph. pp. 24. 1880.

Erie County.

Preliminary list of the Plants of Buffalo and its vicinity. By George W. Clinton. (A.)

In 17th Ann. Rep. Reg. on Cabinet. Albany, 1864. (The same also in 8vo, pamph. pp. 12, Buffalo, 1864, from Bullet. Buff. Soc. Nat. Sci.)

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*These lists and additions have been continued in the succeeding Annual Reports by Mr. C. H. Peck.

Essex County.

Plants of the summit of Mt. Marcy. By Charles H. Peck. (A.)

From 7th Rep. Survey Adirondacks. 8vo, pamph. pp. 12. Albany, 1880.

Lewis County.

Catalogue of the indigenous, naturalized, and filicoid Plants of Lewis County. By Franklin B. Hough (B.)

In Ann. Rep. Regents. Albany.

Madison and Onondaga Counties.

List of Trees and woody Plants growing spontaneously in Madison and Onondaga Counties. By L. M. Underwood. (A.)

In "Geol. Formations Mad. and Onondaga Cos." 8vo, pamph. Syracuse, 1879.

Monroe County.

Catalogue of Plants, and their time of flowering, in and about the city of Rochester, for the year 1841. By Rev. Chester Dewey. (A.)

In 55th Ann. Rep. Regents. Albany, 1842.

New York County.

Catalogus Plantarum quas sponte crescentes in insula Noveboraco observavit Johannes Leconte. (A.)

In Amer. Med. and Philsoph. Register, Vol. ii. New York, 1812.

Catalogue of the Plants growing spontaneously within thirty miles of the city of New York. By John Torrey. (B.)

8vo, pamph. pp. 100. Albany, 1819.

Synoptical view of the Lichens growing in the vicinity of the city of New York. By Abraham Halsey. (C.)

In Annals Lyc. Nat. Hist. Vol. i. New York, 1824.

*Revised Catalogue of Plants growing within thirty miles of New York City. By the Torrey Botanical Club. (B.)

In Bullet. Torrey Bot. Club. New York, 1870–74.

Catalogue of Plants gathered in August and September, 1857, in the terrain of Central Park. By Charles Rawolle and Ig. A. Pilat. (A.)

8vo, pamph. pp. 34. New York, 1857.

List of Plants introduced (in vicinity of New York) with ballast, and on made land. By Addison Brown. (B.)

In Bullet. Torrey Bot. Club, Vols vi and vii. New York, 1879–80.

Catalogue of the Plants collected in Manhattan Square, New York City, in the summer of 1880. By L. P. Gratacap. (A.)

In Amer. Naturalist, Vol. xiv. Philadelphia, 1880.

Oneida County.

Catalogue of Plants found in the County of Oneida. By P. D. Knieskern, M.D. (B.)

In 55th Ann. Rep. Regents. Albany, 1842.

Catalogue of Plants found in Oneida County and vicinity. By John A. Paine, Jr. (C.)

In 18th Ann. Rep. Regents on Cabinet. Albany, 1865.

Orange County.

Plantae Coldenghamiae, in Provincia Noveboracensi Americes

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*Not yet completed.

sponte crescentes, quas ad methodum Cl. Linnaei sexualem anno 1742, etc., observavit et descripsit Cadwallader Colden. (D.)
In Acta Societ. Reg. Sci. Upsala, 1749-51.

Onondaga County.
Filices Onondagenses. By Mrs. S. M. Rust. (A.)
Syracuse (no date).

Queens County.
Plantae Plandomenses, or catalogue of Plants growing near Plandome, Long Island. By C. W. Eddy. (A.)
In Medical Repository, Vol. xi. New York, 1807.

8 7 *Richmond County.*
Flora of Richmond County. By Arthur Hollick and N. L. Britton. (B.)
8vo, pamph. pp. 26. Staten Island, 1879. (Addenda in Bullet. Torrey Club, Jan., 1880.)

Rensselaer County.
Catalogue of Plants growing in the vicinity of Troy. By James Hall and J. Wright, M.D. (B.)
8vo, pamph. pp. 42. Troy, 1836.

Schenectady County.
Catalogue of the flowering Plants of Schenectady County. By E. W. Paige. (B.)
8vo, pamph. pp. 48. Albany, 1864.

Suffolk County.
Catalogue of the phaenogamous and acrogenous Plants of Suffolk County. By E. S. Miller and H. W. Young. (A.)
8vo, pamph. pp. 19. Port Jefferson, 1874. (Addenda in Bullet. Tor. Club, Vols. vi and vii.)

Tioga County.
Catalogue of forest Trees growing wild in the town of Nichols, Tioga County. By Robert Howell. (A.)
In Ann. Rep. Regents. Albany, 1852.

Yates and Seneca Counties.
Catalogue of Plants growing without cultivation in the vicinity of Seneca and Crooked Lakes, in Western New York. By H. P. Sartwell, M.D.
In Ann. Rep. Regents. Albany, 1845.

Westchester County.
Catalogue of Plants growing in the vicinity of North Salem Academy. By S. B. Mead. (A.)
In Ann. Rep. Regents. Albany, 1831-2.
Report on the Flora of Westchester County. By O. R. Willis. (B.)
Appendix to Bolton's Hist. Westchester Co. New York, 1880.

W. R. G.
N. L. B.

§ 17. **Botanical Notes.**—*Curious Fungi in the Nevada Mines.*—The *Virginia City* (Nev.) *Enterprise*, speaking of the old deserted Mexican and Ophir mines, says that fungi of every imaginable kind have taken possession of the old levels. "In these old mines, undisturbed for years, is found a fungus world in which are to be seen counterfeits of almost everything seen in our daylight world. Owing to the warmth of the old levels and to the presence in them of a certain amount of moisture, the timbers have been made to grow some curious crops. Some of the fungi in the old chambers are several feet in height, and, being snow white, resemble sheeted ghosts. In places are what at a little distance appear to be white owls, and there are representations of goats with long beards, all as white as though carved in the purest marble. The rank fungus growth has almost closed some of the drifts. The fungi are of almost every imaginable variety. Some kinds hang down from the timbers like great bunches of snow-white hair and others are great pulpy masses. These last generally rise from the rock forming the floor of the drifts and seem to have grown from something dropped or spilled on the ground at the time work was in progress years ago. These growths have in several places raised from the ground rocks weighing from ten to fifty and even one hundred pounds. Some of the rocks have thus been lifted more than three feet. In the higher levels, where the air is comparatively dry, the fungi are less massive in structure than below and are much firmer in texture. Some resemble ram's horns, as they grow in a spiral or twisted shape, while others, four or five feet in length and about the thickness of a broom handle, hang from the cap-timbers like so many snakes suspended by the tails. One kind, after sending out a stem of the thickness of a pencil to the length of a foot or two, appears to blossom; at least it produces at the end a bulbous mass that has some resemblance to a flower. In all the infinite variety of these underground fungi it is somewhat strange that not one was seen at all like those growing upon the surface in the light of day. Nothing in the nature of toadstools or mushrooms was found."

The fantastic forms assumed by the higher fungi when growing under abnormal conditions of light, heat and moisture, like those above-mentioned, are certainly very curious, and have been the subject of frequent comment. A work descriptive of some of these singular productions found growing in similar situations in Europe was published by George Hoffman in 1811, under the title of "Vegetabilia in Hercyniae subterraneis Collectae." In all these instances the metamorphosis of the fungus remains incomplete, and, in many cases, the plant (to use the words of Fries*) "preserves its mycelium nature, its thwarted growth being limited to a monstrous modification of this mycelium," or to a sort of exuberance which is opposed to the formation of fruit-bearing organs; just as a too luxuriant vegetation often opposes an obstacle to the flowering or fruiting of phaenogams. An example of one of these imperfectly-developed fungi was exhibited by Mr. Fairchild at the January meeting of the Torrey Club. This specimen, which, judging from its texture, color and polished surface was *Polyporus lucidus*, Fr., was obtained from a coal mine in Pennsylvania. It was an elongated growth, about two feet in length and two inches in diameter, consisting of a succession of swellings and appearing as if the fungus had made an attempt at each of these points to produce a pileus.

Chlorophyll in the Epidermis of Leaves.—In a paper contributed to the Scientific Proceedings of the Vienna Academy, Herr A. Stohr,

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**Annales des Sciences Naturelles*, 1860, p. 24.

according to *Nature*, details the results of investigations on the presence of chlorophyll in the epidermis of leaves. Hitherto it has generally been supposed that submerged phaenogamous plants, with a few exceptions, contain chlorophyll in their epidermis, while terrestrial phaenogams, also with a few exceptions, have an epidermis destitute of chlorophyll. Herr Stohr's experiments, however, point to a different conclusion. He finds that while chlorophyll is contained in the epidermis of most of the broad-leaved gymnosperms and of by far the greater number of terrestrial phaenogams, it is absent from that of the needle-leaved gymnosperms and the terrestrial monocotyledons. In most cases the chlorophyll does not occur in the epidermis of the upper surface of the leaf, being quickly destroyed on its formation by a too intense light; but is only to be found in that of the under surface and also of the leaf petioles and stipules. So far as the evolution of the chlorophyll bodies was observed the latter showed themselves as starch-chlorophyll bodies. These experiments were made upon the leaves of nearly one hundred species.

Changes in the Diameter of the Trunks of Trees.—According to the *Gardeners' Chronicle*, MM. Kraus and Kaiser have been making some researches from which it appears that the trunks of trees undergo daily changes in diameter. From early morning to early afternoon there is a regular diminution till the minimum is reached, when the process is reversed and the maximum diameter attained at the time of twilight; then again comes a diminution, to be succeeded by an increase about dawn—an increase more marked than that in the evening. The variations in diameter coincide, therefore, with those of the tension, but they are shown to be inverse to the temperature, the maximum of the one corresponding roughly to the minimum of the other, and so on.

Preparation of Toadstools for the Herbarium.—In a recently-received check-list of plants sent us by the *Schlesischen Botanischen Tausch-Vereins*, we find a method, as practised by Herr E. Jacobasch, of Berlin, of preparing fleshy species of fungi for the herbarium, and which, briefly stated, is as follows: The perfectly fresh toadstool is divided vertically through the centre and the two halves are laid down on stout paper with liquid glue and then submitted to a gentle pressure. The glue immediately penetrates the substance of the fungus and expels all the water contained therein, and so quickly too that in a few minutes the whole surface of the pileus will be seen covered with bead-like drops of moisture. The glue, moreover, drives out or destroys all the insect larvae that may be present. The preparation after one or two days will be found thoroughly dry, and its color, with the exception of being a little darker, will be perfectly preserved. The spores having been collected on paper in the usual manner, are affixed thereto by immersion in milk. Further notes on this same subject will be found on another page.

§ 18. **Botanical Literature.**—Trimen's *Journal of Botany* for January contains articles on '*Chara obtusa*, a species new to Britain,' by H. and J. Groves; 'History of the Scorpoid Cyme,' by Sidney H. Vines; '*Potamogeton lanceolatus* of Smith,' by C. C. Babbington;' Musci

Praeteriti,' by Richard Spruce; and 'Plants of Aran Island, Co. Donegal,' by H. C. Hart.

Botanische Zeitung (No. 52) Dec. 25th. 'Researches on the Origin of Starch-granules,' (with a plate), by A. W. F. Schimper.

Annales des Sciences Naturelles, Tome X, Nos. 2 and 3. 'On the Influence of the Intensity of Light on the decomposition of Carbonic Acid by Plants,' by A. Farmintzin; 'Researches on the rôle of Light in Germination,' by A. Pauchon.

American Naturalist for January. 'On the Fertilization of *Calamintha Nepeta*,' by William Trelease; 'Botanizing on the Colorado Desert,' by Edward Lee Greene; 'Method of distinguishing species of *Populus* and *Juglans* by the young naked branches,' by W. J. Beal.

Journal of the Microscopical Society, Dec., 1880. Williams & Norgate, London and Edinburgh. In this bi-monthly of nearly two hundred pages, there is a vast amount of interesting matter, original and selected. We quote an item of the latter: "Contrary to the views of Reess and Darwin, E. Regel finds that the plants (*Droserae*) thrive best when not treated with animal food." This may be the tendency of Mr. Higley's experiments recorded in recent numbers of the *Botanical Gazette;* yet, with the evidence of our bogs, where one seldom finds a well-developed *Drosera* without the débris of insects on its leaves, it is hard to admit that the plants are not benefitted by their prey.

Geological Survey of California, *Botany*, Vol. II.—The first volume of this work was issued in 1876, the Polypetalae by W. H. Brewer and Sereno Watson; the Gamopetalae by Asa Gray. The Legislature of California having withdrawn its aid, we are indebted (as Prof. Whitney states in a prefatory note) to S. C. Hastings and other gentlemen of San Francisco for the publication of these two noble volumes. The Flora of the second volume—Apetalous Dicotyledons to the end of *Musci* and *Sphagnaceae*—is edited by Sereno Watson. Dr. George Engelmann has elaborated the Oaks, the Pines and their allies and the *Loranthaceae*; M. S. Bebb, Esq., has done the same for the Willows; Wm. Boott, Esq., has supplied the portion upon the *Carices*; Dr. George Thurber the Grasses, and Prof. Daniel C. Eaton the Ferns and other higher cryptogams. If the publication has necessarily been delayed on this account, the superior character of the work is an ample compensation. The extent of the additions that have been made to our knowledge of the flora of the State during the past four years may be seen by reference to the many papers devoted to them—62 pages of additions and corrections. There still remains ample opportunity for good botanical work at almost every locality among the mountains, hills and valleys of the State.

The second volume is provided with analytical tables and a complete index to the ten volumes, and with two appendices, numbered I. and IV. Appendix I. is a glossary of botanical terms employed, and IV. is a list of persons who have made botanical collections in California, by W. H. Brewer. To this is added a supplement, by Mr. Watson, of especial acknowledgment to those whose contributions have aided essentially in the preparation of the work, and among these are several ladies whose names must be familiar to our readers. The hiatus in the numbering of the appendices is owing, we suppose, to the omission of the accented list of generic names, with their derivations contemplated in the first volume, and to the omission of the mere lists of some of the lower cryptogams, which was all that their incomplete collection and study would authorize. After the mention made of the master hands engaged upon this work, we have no need to commend it further to our readers. The volumes, one or both, can be obtained from Sereno Watson, Botanical Garden, Cambridge, Mass. The price per volume to botanists is $5.00. Advise whether to be sent by mail (postage 40 cents a volume) or by express.

The Flora of Essex Co., Mass., By John Robinson, Essex Institute, Salem, Mass. After the preface comes the literature of the subject, and then an introduction giving a general account of the character of the flora. The land plants of the county belong decidedly to the northern flora, although not so arctic in their character as the lichens and algae. "There is an almost total absence of many species common from Cape Cod southward and often found just south of Boston. In contrast to this the *Magnolia glauca* is still quite abundant at Gloucester, but not found again north of New Jersey. At Cape Ann is the southern limit of the little *Sagina nodosa*, and there is also found *Potentilla tridentata*, familiar at the Isle of Shoals and on Mt. Washington. Essex County seems also to be the southern limit, for this region, of *Pinus resinosa* (red pine), *Abies nigra* (black spruce), *Vaccinium Vitis-Idaea*, *Viola rotundifolia*, etc., as it is the northern limit of *Cupressus thyoides* (white cedar), *Quercus prinoides* (chinquapin oak), *Polygonum Careyi*, *Draba Caroliniana*, *Lygodium palmatum* (climbing fern), and others. At Boxford is what has proved thus far to be the only New England station for *Salix candida*; and another bog willow, *Salix myrtilloides*, is occasionally met with. At Andover a locality for *Calamagrostis Pickeringii* was discovered in the summer of 1879; this species has only been known before at the White Mountains." After the Introduction we have a sketch of some of the early botanists, and then the Flora, which takes in the Algae, but omits the Fungi. Prof. Robinson has had the aid, in various of the more difficult orders, of specialists to whom he makes his acknowledgments, particularly of Mr. Chas. J. Sprague in the Lichens, and of Mr. Austin in the Musci and Hepaticae. There is a good index at the end. Those who know Prof. Robinson's love of good work will not be disappointed in this catalogue, though some of the determinations, in so wide a range of orders, many of them yet imperfectly studied, may admit of difference of opinion.

Correspondance Botanique.—Prof. Ed. Morren of Liége, Belgium, sends us his annual list of Botanic Gardens, Chairs, Nurseries, Reviews and Societies. The United States seem to be quite well reported. Price 3 francs.

Botanical Exchanges.—We have frequently been asked the address of European botanists who would exchange European for American plants. We have before us the Nineteenth Annual Exchange-List of the *Schlesischen Botanischen-Vereins.* Address Adolph Toepffer, Brandenburg a | H, Prussia.

§ 19. **The Syracuse Botanical Club.**—Some time since, the Syracuse Botanical Club conceived the idea of an Author's Party, whereby the treasury of the association could be benefitted, and at the same time those contributing to aid the association might combine pleasure with business. Mrs. Rust threw open the doors of her spacious mansion for the good cause, and invitations were extended to those citizens who were expected to be present. The responses to the invitations were very numerous, and the assemblage included many of the more prominent citizens of Syracuse. At an early hour the guests began to assemble, and a diversified, quaint and motley appearance they made in their various character-costumes. They were received by a committee designated for the purpose and announced by their proper tickets. All sorts of characters were represented. The amount realized was about ninety dollars, which is to be used for purchasing microscopes, books, etc. for the Club's work. During the last season, beginning with April, the Club made twenty-nine field excursions and realized therefrom twenty-two dollars. A club room has been rented, a herbarium case purchased, and classes have been organized for the study of structural botany, under instruction of the President, The Club has undertaken the collection of all the lists of plants that have been made by different observers, and intends in the course of time to publish a complete flora of Onondaga County. The officers for the present year are as follows: President, Mrs. S. M. RUST; Vice-President, Mrs. H. S. GIFFORD; Treasurer, Mrs. A. D. FAIRBANKS; Corresponding Secretary, Mrs. M. J. MYERS; Recording Secretary, Mrs. H. ROWLING.

§ 20. **Proceedings of the Torrey Club.**—The regular meeting of the Club was held at the School of Mines, Columbia College, Tuesday evening, January 11th, the President in the chair, and twenty-six members and fourteen visitors present.

After opening the meeting the President announced to the Club the great loss that it had recently sustained in the death of its valued member, Alphonso Wood, and, in a few brief remarks, paid a graceful tribute to his memory.

On motion, a committee of three was appointed to draft appropriate resolutions expressive of the esteem and respect in which Prof. Wood was held by his fellow-members, and extending to his family the Club's deep sympathy.

This being the annual meeting, officers for the present year were balloted for with the following result:

President, J. S. NEWBERRY; Vice-President, A. BROWN; Treasurer, W. H. RUDKIN; Corresponding Secretary, B. BRAMAN; Recording Secretary, G. M. WILBER; Editor, W. H. LEGGETT; Curator, P. V. LEROY.

According to previous announcement, Mr. C. F. Cox read a very instructive and interesting paper on a subject of which he has long made a specialty—Plant Hairs—and which was well illustrated by beautiful microscopic preparations thrown upon a screen. The paper was of such a nature that justice cannot be done it by a mere abstract especially without illustrations).

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VIII.] New York, March, 1881. **[No. 3.**

§ 21. Emendation of the Genus Fendlera.

By Edward Lee Greene.

Last September, while exploring the highest rocky summits of the San Francisco Mountains of South-eastern Arizona, I came upon some bushes growing in the rocky crevices, and the first sight of which called forth the exclamation: "A second species of *Fendlera!*"

With the typical species of that genus the shrub was indeed considerably at variance. The flowers instead of being solitary were in small cymes; the petals were five instead of four; and the filaments were merely subulate, lacking those linear lobes which, in *F. rupicola*, are produced beyond the anthers. I was nevertheless very confident that the supposed new species would have to go into *Fendlera*, although the published character of the genus would need modification in order to admit it. Without giving the plant further study, I labeled my specimens *Fendlera cymosa*, n. sp., and so distributed a number of them among my correspondents. Familiar as I am with the types of both *Fendlera* and *Whipplea*, and knowing that there had been a second species from Utah added to the latter genus within a few years, it never occurred to me that my Arizona shrub could possibly be a *Whipplea*, until one of my correspondents wrote: "I recognize in your *Fendlera cymosa*, Mr. Watson's *Whipplea Utahensis.*" On receiving this somewhat mortifying bit of intelligence, I brought forth my best specimens of the two genera, and, with the original descriptions and plates before me, commenced a critical study of all the materials; the result of which is, a settled conviction corresponding with my first impression, that the *Whipplea Utahensis*, Wats. is not of that genus, but a *Fendlera*; and in accordance with that conviction I subjoin an emendation of the original characters of *Fendlera*, with descriptions of the two species, fully confident that if my esteemed friend Mr. Watson had been very familiar with *Whipplea modesta* and *Fendlera rupicola* in their native haunts, and had been favored with good specimens of this in some respects intermediate species, he would unhesitatingly have placed it in *Fendlera.*

FENDLERA, Engelm. & Gray. *Pl. Wright.* I., 77.

Calyx green-herbaceous, the turbinate tube 8-10-costate, more or less adherent to the ovary, limb of 4-5 lanceolate segments, valvate; petals 4-5, unguiculate, erose, convolute in bud; stamens 8-10, inserted with the petals, filaments broad and flat, anthers 2-celled, introrse; styles 3-4, stigmas simple; ovary semi-superior, 3-4-celled, with 1 to several ovules in each cell; ovules pendulous, anatropous; capsule crustaceous, ovoid– or oblong–conical, more or less adherent to the calyx-tube, splitting from the apex, the divisions pointed with the persistent style; seeds with a loose, membranous, reticulated testa, which is winged at the base.

Erect, much-branched, rigid shrubs, with opposite, entire, subsessile, deciduous leaves; the branchlets terminating in a solitary flower, or in a cymose cluster.

Natives of the arid, rocky districts of the South-western United States, east of the Sierra Nevada.

§ 1. EUFENDLERA. *Flowers solitary or in threes, 4-merous; filaments linear, with two linear-attenuate lobes which are produced beyond the anthers; cells of the capsule several-seeded.*

FENDLERA RUPICOLA, Engelm. & Gray.—Shrub 3-6 feet high; leaves lanceolate, about an inch long; hairs of the upper surface of the leaves very short, stout and erect, of the lower, long and appressed; flowers large and mostly solitary at the ends of the branchlets; calyx-tube short-turbinate; segments triangular-lanceolate; petals ovate-deltoid, with a long claw, deciduous; stamens 8; styles 4; ovary 4-celled; capsule ovoid, the calyx-tube adherent only to its base.

A beautiful shrub of the mountains of Texas and New Mexico, putting forth in May a profusion of large, white or rose-colored flowers, which give it the aspect of a small peach-tree.

§ 2. FENDLERELLA. *Flowers in compound cymes, 5-merous; filaments broadly subulate; cells 1-seeded.*

FENDLERA UTAHENSIS.—Shrub 6 inches to 2 feet high, much branched; leaves oblong, attenuate to the base; sparingly long-hairy, 3-nerved; flowers small, in a compound cyme; calyx cylindrical-turbinate, the lobes subulate; petals oblong, unguiculate, white; stamens 10; styles 3, stigmatic portion on the inner side, near the summit; capsule oblong, adherent to the calyx-tube for half its length.

Whipplea Utahensis, Watson, *Amer. Nat.*, vii., 300, and *Bot. Calif.* i., 203. Inhabiting dry rocky mountain summits of Utah and Arizona.

While *F. Utahensis* certainly brings the genera *Whipplea* and *Fendlera* into closer juxtaposition, it does not at all invalidate the former, which still rests upon good characters of its own, that are to be sought chiefly in the calyx, capsule and seed. Its calyx, instead of being green and of a sub-coriaceous thickness of texture, is thin and whitish; the calyx-tube is hemispherical, rather than turbinate; its capsule is nearly globose; its seeds are not winged; its petals are imbricated in the bud, and have the margins involute, while both species of *Fendlera* have a convolute aestivation, and petals with erose margin. *Whipplea* has, moreover, a centripetal inflorescence; the flowers being mostly opposite in a long-peduncled raceme; and, in habit, as well as from a geographical point of view, it is most unlike *Fendlera.* It is a weak, half-reclining undershrub of the deep, moist woods of the Coast Range of California. Both *Fendlerae* are rigidly erect, brittle, hard woody shrubs of the dry, sun-burnt rocks of the interior desert regions of the South-west.

§ 22 Some New Species of North American Fungi.

By J. B. ELLIS and H. W. HARKNESS, M.D.

ASCOMYCES ANOMALUS, E. & H.—Albus, orbicularis vel subconfluens; ascis oblongo-cylindraceis sporida octo oblonga hyalina foventibus.

On bark of old pine logs lying on wet ground, Newfield, N. J., Oct., 1880.

Forming thin white, suborbicular or subconfluent patches 1-8′—1-4′ across, so that the bark appears as if splashed with white-wash. Sporidia oblong, about .00015′ long. Remarkable for its unusual place of growth.

DENDRYPHIUM HARKNESSII, Ellis.—Nigro-olivaceum, cespitosum; hyphis erectis, superne ramosis; conidiis cylindraceis, 3—6 septatis.

On bark of a cedar log in wet woods, Newfield, N. J., Oct., 1880.

Tufts nearly black when fresh, olivaceous when dry; fertile threads sparingly branched above, and bearing at their tips 3–5 concatenate, cylindric, 3–6–septate conidia, .0012′—.0015′x.0003′.

Readily distinguished from *D. Ellisii*, Cke. by its tufted mode of growth.

Var. LEPTALEUM, found at Northampton, Mass., by Dr. Harkness, on bark of grape-vine, differs in its more dwarfish habit and smaller conidia, which are generally only 3-septate.

HELICOSPORIUM THYSANOPHORUM, E. & H. Cinereum, dense cespitosum; conidiis thysanoideis spiris 8–10 convolutis.

On the pitchy bark of an old pine log. Newfield, N. J., Oct., 1880.

Cinereous, densely cespitose, tufts about the size of a large mustard-seed, sometimes effused, conidia cylindric; open at each end, and consisting of 8–10 coils, .001′ long by about half as wide.

The fertile threads, which arise from a brown, branching, rather sparing, creeping mycelium, are very short, nearly transparent and coiled upon themselves above so as to form the conidia, which resemble coils of rope or curls. Sometimes the erect thread appears to divide above and produce two coils.

FUSARIUM SCHWEINITZII, E. & H. Tuberculiforme, albo-fuscum, superne leviter concavum; conidiis oblongis, obtusis, subcurvatis.

In cracks of the bark of a dead grape vine. Newfield, N. J., Oct., 1880.

Tuberculiform or substipitate, discoid above, dark cinerous with the exception of the pulverulent pallid disk; conidia oblong or clavate-oblong, obtuse and generally slightly curved; borne on the tips of compacted threads, which form the body of the fungus. Allied to ***Fusarium album***, Sacc.

CERCOSPORA LIRIODENDRI, E. & H.—Hyphis fasciculatis, brevibus; conidiis suboblongis, uniseptatis, hyalinis.

On leaves of *Liriodendron Tulipifera*. Vineland, N. J., Oct., 1880.

Hypophyllous, seated on small (1-16′ diameter) brown spots bounded by the veinlets of the leaf; fertile threads fasciculate, short, sparingly septate and bearing at their tips the irregularly-oblong uniseptate, hyaline, .0008′x.0002′ conidia.

CERCOSPORA MAGNOLIAE, E. & H.—Hypophylla, maculis punctiformibus; amphigenis; hyphis fasciculatis, atris, septatis; conidiis clavatis.

On living leaves of *Magnolia glauca*. Newfield, N. J., Nov., 1880.

Spots suborbicular, minute, less in size than the head of a pin, visible on both surfaces of the leaf and surrounded by a raised border. Fertile threads fasciculate, septate, black or dark-brown, .001′—.0015′ in height, bearing at their tips the clavate, 3-5-septate, .0008′—0015′ long conidia; Only about two to four tufts of the fungus grow on each spot.

SEPTONEMA TABACINUM, E. & H.—Pulvinulis e tabacino nigris, sparsis; hyphis simplicibus, echinulatis, in conidiis cylindraceis, 3-4-septatis facile dilabentibus.

On indurated pitch on the bark of an old pine log. Newfield, N. J., Nov., 1880.

Tufts scattered, about the size of a small mustard-seed, snuff-colored at first, then becoming nearly black; erect threads simple, echinulate, constricted at intervals and separating into cylindrical, 3-4-septate, .0008′—.001′x.00014′ conidia.

§ 23. **Notes on the Flora of PresqueIsle, Pa.**—Several visits which I paid last year to our large peninsula enabled me to add a few more species to the already large list of interesting plants found on that remarkable piece of land. The water in the ponds being unusually low during the latter part of the summer facilitated access to some places hitherto not visited. The muddy shores of the ponds abounded in *Utriculariae*, of which six species were found: *U. vulgaris*, L., *U. minor*, L., *U. intermedia*, Hayne, *U. gibba*, L., *U. resupinata*, L., and *U. cornuta*, L. *Sparganium minimum*, Bauhin, Fries, was found with prostrate leaves on places usually inundated. *Polygonum amphibium*, L., and *P. Careyi*, Olney, grew side by side on the margins of some of the ponds. Growing in shallow water, I found *Scirpus fluviatilis*, Gray, *Carex aquatilis*, Wahl., and *C. filiformis*, L. *Eleocharis quadrangulata*, R. Br., was never so thrifty before; both it and the wild rice (*Zizania aquatica*, L.) covered acres in the ponds, and presented a serious obstruction to the passage with boats. The wild rice was sown here a few years ago by the members of our Game and Fish Association in order to induce the ducks and reed-birds to make their homes on the peninsula. The soil and surroundings seem to be genial to this western grass, for it conquers more and more ground from year to year.

On dried, sandy places I found in spring, *Carex umbellata*, Schk., plentiful, and *Oryzopsis asperifolia*, Michx., sparingly; later in the season I added *Panicum glabrum*, Gaudin, *Bromus racemosus*, L., and *Lechea major*, Michx., as new acquisitions to my list.

There is one spot near the eastern end of Presque Isle, that is a perfect paradise for the botanist—a greater variety of beautiful and interesting plants being seldom found on so small a space. *Physostegia Virginiana*, Benth., is the first to adorn this spot with its long spikes of handsome purplish-tipped flowers, and it is closely followed by *Sabbatia angularis*, Pursh, finer specimens of which I have seldom seen. *Gerardia purpurea*, L., *Lobelia Kalmii*, L., *Linum Virginianum*, L., *Utricularia cornuta*, Michx., occupy the ground almost all at the same time, and are followed by *Spiranthes cernua*, Rich. A pleasing background to this natural flower-bed is afforded by a thrifty growth of *Cladium mariscoides*, Torr., *Carex Œderi*, Ehrh. and *Juncus alpinus*, Villars, var. *insignis*, Fries; while a few steps further off we find *Triglochin palustre*, L.

Prunus pumila, L., is described in Gray's Manual as "depressed and trailing, 6′—18′ high," but on Presque Isle we find this cherry often from 40°—60° in height. My most interesting find, perhaps, is a willow, which Mr. Bebb has now under examination, and which may be a variety of *Salix adenophylla*, Hook. Few new discoveries were made in the vicinity of Erie, the most interesting find being a patch of *Althaea officinalis*, L., discovered east of the city by J. Miller, a member of our Botany Section.

G. GUTTENBERG.

§ 24. **The Development of Sphaeria Solidaginis,** Schw.—This fungus, which is common on various species of *Solidago* all through the Atlantic slope of the United States, was first collected by Schweinitz in Carolina over half a century ago and described in his *Synopsis Fungorum Carolinae*, as *Sphaeria Solidaginis*; but in more recent times it has been referred to the genus *Dothidea*. Those who have observed this species in a living state have doubtless noticed the fact mentioned by Schweinitz that it is often found in company with an *Uredo*. It is to this peculiarity that I wish to call attention. As early, at least, as September the lower surface of the leaves on the Solidagos affected with this fungus will begin to show the presence of the *Uredo* (*U. Solidaginis*, Schw.), which, as Baron de Thümen has shown (Vol. vi, p. 216 of this journal), is really a *Coleosporium*.

The radical leaves will generally be the first affected, but, soon after, also those of the stem and even the bract-like leaves among the inflorescence. In some species, especially *Solidago lanceolata*, the branches of the panicle and the main stem itself are thickly dotted with the *Coleosporium*. By the middle of October, or sooner, it will be noticed that the orange-red color in many of the clusters of *Coleosporium* spores (especially those on the radical and lower cauline leaves) has changed to a dark-brown or nearly black, and an examination with a lens will show, not the spores of the *Coleosporium*, but a little black, subglobose, crustaceous stroma about the size of a large mustard-seed, and which is in fact the pycnidium of the *Dothidea*, and contains hyaline, fusiform, uniseptate stylospores, .0006′—.0007′ x .00015′. The perfect fruit or sporidia, which much resemble the stylospores, will not appear till the following spring or summer. Further examination will show that some of the *Coleosporium* clusters appear partly orange and partly brown or black; and, if a section be made of one of these and examined under the microscope, it will be seen that in the midst of the cluster of *Coleosporium* spores, the black, cellular, crustaceous stroma of the *Dothidea* is in process of formation.

From repeated observation of the facts here briefly stated I believe the *Coleosporium* to be the rudimentary stage of the *Dothidea*, and hope to be able during the coming season to collect and distribute, in the "North American Fungi," specimens to illustrate this view.

Newfield, N. J., Feb. 10, 1881. J. B. ELLIS.

§ 25. **The Herbaria and Botanical Libraries of the United States, IV.**—THE MASSACHUSETTS HORTICULTURAL SOCIETY. 1. *The Botanical Library.*—If the value of a Library depends more upon the character than the number of the volumes which it contains, and upon its adaptability to the purposes for which it was designed, then the library of the *Massachusetts Horticultural Society* is one of the finest, if not *the* finest in the United States.

As might be expected from the nature of the Society and its work, the greater number of its books are devoted to Horticulture and Agriculture, departments in which it is unexcelled; but, recognizing the importance of botanical knowledge to the intelligent cultivator, this department has been wisely and generously fostered—many rare and valuable works having been purchased from time to time—until at present full twenty-five per cent. of the whole number of volumes is devoted to Botany. Many works not strictly botanical might be added to the list, increasing the proportion to nearly one-third. Of this latter class are many valuable works of a semi-horticultural and botanical character, on the culture of orchidaceous plants, and which are not included in the present estimate.

The number of books in the library at the present time exceeds 4,000 volumes. As stated by Mr. Manning, in the History of the Society, the number at the close of the year 1878 was 3,400 books and 600 pamphlets, but this number has been since increased by some valuable additions.

All the current text-books on botany—including some old and rare editions long out of print—are to be found upon the library shelves. The names of Gray, Torrey, Chapman, Bigelow, Beck, Darby, Wood, Eaton, Nuttall, Barton, Balfour, Hooker, Greville, Bentham, Henfrey, Harvey, Berkeley, Thornton, Cooke, Sachs, Thomes, Prantl, Dresser and Bessey are sufficient to indicate the character of this section.

Of the more important works may be mentioned: Alph. de Candolle's "Laws of Botanical Nomenclature,' 'Prodromus Systematis,' 'Collection de Mémoires,' etc.; A. Ph. de Candolle's 'Géographie Botanique'; A.and C. de Candolle's 'Monographiae Phanerogamarum'; Linnaeus' 'Systema Plantarum,' 'Species Plantarum,' etc.; Le Maout and Decaisne's 'Traité Général de Botanique' (Mrs. Hooker's translation;) E. St. Pierre de Germain's 'Dictionnaire de Botanique'; Loudon's 'Hortus Brittanicus'; Plumier's 'Plantes de l'Amérique'; Draakenstein's 'Hortus Indicus Malabaricus'; Gmelin's 'Flora Siberica'; Grisebach's 'Plantae Wrightianae'; Batsch's 'Genera Plantarum': Robert Brown's 'Flora Novae Hollandiae' (London ed. suppressed by the author); 'Journal of the Proceedings of the Linnean Society'; Curtis' 'Botanical Magazine'; 'Flora Londinensis'; Sowerby's 'English Botany,' first and second editions, etc., etc., while the names of Braun, Steudel, Koch, Fries, Siebold, Lemaire, L'Heritier, Walpers, Thunberg, Michaux, etc., suggest other works of great importance and value.

Cryptogamic botany has not been overlooked, and the favor accorded to fern books, even by those who are not specially interested in the subject of which these treat, is particularly noticeable here, where pteridologists and pteridophiles alike will find ample material to aid them in their studies. Hooker's (and Bauer's) 'Genera Filicum,' 'Icones Filicum,' 'Century of Ferns,' 'Species Filicum,' 'Synopsis Filicum' (editions 1868–74), 'Filices Exoticae,' etc.; Smith's 'Historia Filicum' and 'British and Foreign Ferns'; Moore's 'Nature-Printed Ferns' (octavo and folio editions); Lowe's 'New and Rare Ferns, etc.; Newman's 'British Ferns'; Sowerby's, Johnson's, Anne Pratt's and Heath's fern books; Presl's 'Pteridographia'; Kunzius' 'Index Filicum'; Swartz's 'Synopsis Filicum'; besides many valuable papers scattered through other works are here, along with Eaton, Robinson, Williamson and the present writer, to represent our American fern literature.

In the mosses and other lower cryptogamia, we have Sullivant's 'Mosses of Eastern North America,' etc.; Berkeley's 'British Mosses'; Schimper's 'Bryologia Europaea'; Harvey's 'Nereis Australis,' 'Nereis Boreali-Americana,' 'Phycologia Australis,' 'Phycologia Britannica,' etc.; with many other invaluable works, by Bischoff, Fée, Agardh, Schweinitz, Dillenius, Acharius, Greville, Hoffman, Eschweiler, Kutzing, Pringsheim, Thuret, Leighton, Tuckerman, etc., etc.

It is not possible in a notice of this kind to do more than indicate the character of the whole by the selection of a few; and an examination of the library itself, or of its catalogue, will alone show its value and importance to botanists. In 1869 ex-President Josiah Stickney bequeathed to the Society the income from $12,000 for thirty years, $700 of which are devoted annually to the purchase of books. With this means—termed the "Stickney Fund"—at its disposal, and with such additional sums as the Society may appropriate from time to time, the Library Committee is able to take advantage of every opportunity to procure desirable works; but as these are generally expensive, the number of books added yearly is limited. The library has received many additions by donations from various sources, the most important accession being that of the extensive collection of books bequeathed by Rev. John Lewis Russell, of Salem, who for many years was professor of botany and horticultural physiology to the Society. Prof. Russell's private library was especially rich in works on cryptogamic botany—embracing many invaluable papers, pamphlets and local catalogues, all of which came into the possession of the Society soon after his death, forming an enduring monument to the memory of a fine botanist and a beloved clergyman.

The library is open for reference at all times, and the genial Librarian is ever ready and pleased to assist strangers in finding such works as they may wish to consult.

2. *The Herbaria.*—The Society's herbaria consist of several distinct collections of plants from different sources, but the special collection of North American Ferns to which the Torrey BULLETIN gave the name of "Davenport Herbarium" is the only one generally known. In May, 1857, the Society received a collection of fifty species of plants from Crete, presented by Dr. Giuseppe Monarchini, U. S. Consul to the Island of Crete, and a corresponding member of the Society.

In August of the same year, "A lady in Roxbury" (Mass.) presented a small collection of flowering-plants and grasses. In 1856, Mrs. Isaac Clements, of Mechanicsville, Saratoga Co., N. Y., presented a collection of native plants, for which she was awarded the Society's Silver Medal

In 1864, the daughter of Dennis Murray (then deceased, but a former member of the Society, a frequent exhibitor of native plants and an excellent botanist) presented a collection of one hundred and twenty-five species of native flowering-plants, collected near Boston; eighty species of vascular cryptogams from America and Great Britain; and sixty species of native and introduced grasses. There is also a collection of thirty species of native and garden-plants from an unknown source.

In June, 1875, Mr. George E. Davenport presented the collection of American ferns now everywhere known as the "Davenport Herbarium." At present writing there remain no actual *desiderata* except root-specimens of *Cheilanthes leucopoda* and *Pellaea aspera*, and native specimens of *Pellaea ternifolia* and *Adiantum tricholepis;* but these are deficiencies that cannot remain long unsupplied if we consider how many ferns, long regarded as rare and difficult to obtain, have been placed within the reach of all through the exertions of recent collectors. The collection now contains over 600 mounted sheets representing 31 genera, 149 species as here recognized (or 151 by Prof. Eaton's Fern List), and some twenty-two or twenty-three hundred specimens. Many sheets of other vascular cryptogams have been mounted and are nearly ready to add to the herbarium.

Besides these collections, there is a small one of ferns from Pulney Hills, Southern India, presented in 1878 or '79 by Mrs. Van Brunt.

Boston, Feb. 1881. G. E. D.

§ 26. **A Silene with Pentamerous Ovary.**—The symmetry in the flower of the genus *Silene* is destroyed by the suppression of two carpels in the gynoecium (sepals 5, petals 5, stamens 2x5, pistils 3). In a specimen of *Silene Pennsylvanica*, Michx. I have detected a well-developed ovary formed of *five* carpels, which, had they been permitted to ripen, would certainly have opened by ten teeth. This pod shows, if nothing else, how closely *Silene* and *Lychnis* are related; so closely, in fact, that if such a case as this were of frequent occurrence there would be little left to distinguish the two genera.

Hoboken, Feb., 1881. JOSEPH SCHRENK.

§ 27. **The Preparation of Fleshy Pileate Fungi for the Herbarium.***—For all preparations of fungi, with the exception of those of spores, I use, as a supporting material, paper coated with gelatine, and which I shall call "gelatine-paper." This is prepared by dissolving one part of gelatine, broken in small pieces, in five parts of boiling-hot water, in the following manner: A deep porcelain dish is placed on the top of a vessel of boiling water in such a way that the bottom of the dish is kept constantly immersed in the latter. The proper quantity of boiling water is then poured into the dish, and the gelatine is introduced by degrees and stirred about until the last portion is completely dissolved. While the dish is still resting on the vessel of hot water, very stout writing-paper is coated by means of a brush with the warm solution of gelatine and allowed to dry. The solution must be spread over the paper as thickly as possible. With a solution of one ounce of gelatine in five ounces of water I generally coat 34 quarto sheets of writing-paper. A stock of this paper is kept constantly on hand so as to have it in readiness when it is desired to prepare fungi for the herbarium. To use the gelatine-paper both surfaces of one of the quarto sheets are moistened, and the sheet, with its prepared side up, is laid on a flat dish which has been previously made wet. The gelatine very quickly swells up by reason of the imbibed moisture and is then in a condition to adhere to the likewise moist, prepared fungus-sections. The paper being ready for the reception of the specimen, the latter is prepared as follows: With a sharp, thin knife a vertical section is made down through the toadstool so as to divide it into two equal portions. Next, from the inner portion of one of the halves a thin vertical slice is removed and laid upon the moist gelatine-paper. Then another specimen is taken, its stipe is cut off close to the pileus, and the latter, as well as the stipe, is divided vertically into two parts. Then, by means of a sharp knife with a curved blade, the greater portion of the fleshy substance is removed from the under side of the divided pileus so as to leave but a very thin layer, and the two portions thus treated are laid, this side downward, upon the gelatine-paper. The two halves of the stipe are prepared in the same way. For the sake of economy the preparations are laid closely side by side upon the paper, and when the sheet has been filled it is ready for the press. The prepared sheet is then underlaid and overlaid with six or eight sheets of bibulous white paper, and on the top of the whole is placed a piece of board, which is loaded with a weight of about 55 pounds. For pressing, I always employ a weight and never a press. The pressure of the former is continuous, while a screw-press does not act upon an object which shrinks greatly in drying. I have found that for the majority of fungus-preparations the weight already stated (55 pounds) is most suitable. At the end of 24 hours the driers are to be changed. On carefully removing the under dryer from the surface of the preparations these will be found already fast adherent to the gelatine-paper, although the free portions of the latter do not stick to the dryer. After substituting dry sheets of paper for the damp ones, the whole is submitted to pressure as before. After three or four changes, and also at the end of the same number of days, the prepations will be thoroughly dry. Fungi which contain a large amount of moisture would better be changed the first time at the end of twelve hours. Preparations made on successive days, must, when placed under the same press, be separated from each other by thick card-board, so that partially or nearly dry specimens may not absorb moisture from the fresher material. The pileus-preparations of some fungi may be affixed to the gelatine-paper without the intervention of pressure. The method of procedure in this case I shall describe farther on. Owing to the quick adherence to the gelatine-paper of these preparations made from the living individual they cannot in the least contract on drying. For this reason they retain a nearly unaltered external form; and, as the gelatine as here employed is like jelly, it does not penetrate the preparation and so the latter keeps its color. In the manufacture of the gelatine-paper a very stout kind of writing-paper must be employed, since thin paper is powerless to prevent the wrinkling up of many preparations—it contracts along with them and becomes crumpled and folded.

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*G. Herpell in *Verhandl. des naturhistorisch. Vereins der preuss. Rheinlande u. Westfalens*, 1880.

I omit the author's preliminary remarks on collecting fungi, and will merely state that he recommends that none but good characteristic specimens should be taken, and that these should be as perfect as possible—snail and worm-eaten and water-soaked individuals being rejected.—W. R. G.

The preparations thus dried on the gelatine-paper are finally cut out with a pair of scissors and affixed to card-board with gum arabic in the following manner. First the stipe is gummed down and over its upper extremity is placed one of the pileus-sections, so that the preparation exhibits a profile-view of the fungus. By the side of this is gummed one of the vertical sections. Owing to the paper being gelatinized the gum arabic cannot come in contact with the preparation and thus affect its color.*

These two preparations—the vertical and profile views—along with the spore-preparation (to which I shall devote a special chapter), exhibit the most prominent characters of a species. In the vertical section is to be seen the thickness and color of the flesh of the pileus; the diameter of the stipe from base to apex; whether the stipe is continuous with the substance of the pileus or separable therefrom, and whether it is hollow, or stuffed, or solid. Furthermore, in the sections of lamellate species are to be seen the width and mode of insertion of the gills and the character of their edges; and, in those of species of *Boletus* and *Hydnum*, the length, diameter, etc. of the pores and spines. The profile view exhibits the size, form and the external nature, such as color, markings and investiture, of the whole fungus. The spore-preparations possess the natural color of the spores and give likewise an exact negative copy of the under surface of the pileus.

§ 28. **Some Fungi from New Mexico.**—A small package of fung recently sent me from New Mexico, by Mr. H. H. Rusby, included the following species: *Polyporus nitens*, Fr. (imperfect, but apparently this species); *Podaxon carcinomalis,* Fr.; *Geaster hygrometricus*, Pers.; *Scleroderma Geaster*, Fr.; and an undescribed *Æcidium*, which may be named

ÆCIDIUM RUSBYI, *n. sp.*—Peridia elongated, slender, cylindrical, white, rosy at the base; mouths surrounded by fringe-like teeth; spores deep orange-yellow. Seated, mostly in parallel series, along the midrib on the under surface of leaves of *Fendlera rupicola.* Spermogonia in circinnating clusters on a thickened purplish-brown subiculum.

W. R. GERARD.

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*The author has referred, in his prefatory remarks, to the injurious effects exerted on the colors of fungi by allowing the specimens to come in direct contact with mucilage of gum arabic, the bright red color of such a species as *Agaricus muscarius*, for instance, being quickly changed thereby to a dirty reddish-yellow.

§ 29. **Note on Cynosurus cristatus.**—In the last number of the *Botanical Gazette*, Mr. G. Guttenberg mentions finding *Cynosurus cristatus*, L., near Lake Chautauqua, N. Y., last summer. I collected this plant at Bangor, Maine, in 1876, and at Portland in 1878—in localities where it was evidently introduced. The late Mr. Coe F. Austin collected it in some abundance at Hoboken, New Jersey, in 1868. It seems to have gained an extended footing in this country, and may be regarded a well-established species. This grass is common in England, where it is perennial and is known as "crested dogs-tail grass."

F. Lamson Scribner.

Girard College, Philadelphia.

§ 30. **Botanical Literature.**—The *Revue Mycologique.* The first part (dated January) of the current volume of this Mycological and Lichenological French quarterly has just come to hand, and contains more original communications than usual. Descriptions of new fungi are furnished by MM. Gillet, Brunaud, Karsten, Kalchbrenner, Roumeguére and Saccardo; a new systematic arrangement of several orders of the Hymenomycetes is contributed by M. Karsten; and notes and comments on various subjects relating to the fungi and lichens and their literature make up the remaining portion of the number. Five plates are furnished to illustrate the text. The loose manner in which the pages are thrown together makes reference to this periodical very inconvenient.

In the *Botanical Gazette* for February, Dr. Howe presents evidence to show that *Carex Sullivantii* should not be regarded as a genuine species, but as merely a hybrid between *C. gracillima* and *C. pubescens.* Mr. Higley gives another instalment of his experiments on carniverous plants; Prof. Bessey describes two easily-constructed apparatus for measuring the longitudinal growth of plants; and Dr. Vasey describes a new species of *Trichostema* (*T. Parishi*) from California.

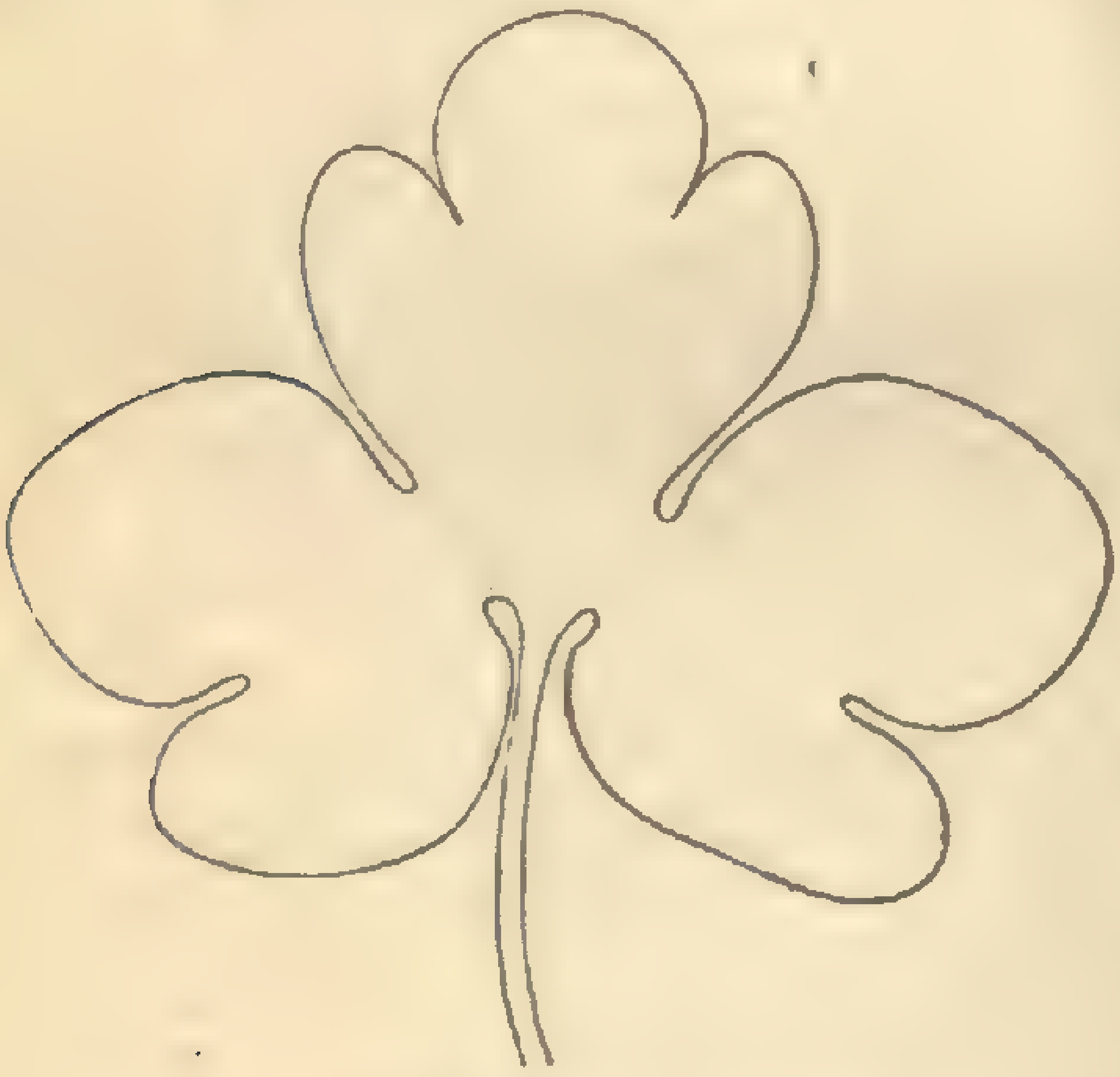
In Trimen's *Journal of Botany* for February, R. A. Pryor has some 'Notes on the Herbarium of Abbott'; Dr. Hance describes a new Melastome of the genus *Otanthera*; W. A. Beckwith presents some 'Notes on Shropshire Plants'; and G. S. Jenman gives a 'Third Supplement to the Ferns recorded in Grisebach's Flora of the British West Indies.'

The Botanical Collector's Hand-book.—Under this title, Mr. George A. Bates, of Salem, Mass., proposes to issue early in the spring of the present year, a work which will prove of value not only to young botanical collectors but also to older and more experienced workers. The author, Mr. W. W. Bailey, who is well known to our readers, has had long experience as a collector, and no one could be found better qualified to undertake the elaboration of such a work. In the preparation of his manuscript Mr. Bailey has had the hearty co-operation of Prof. D. C. Eaton, of Yale College, Prof. John Robinson, of the Essex Institute, Prof. W. G. Farlow, of Harvard University, and many other prominent American botanists. Some of these gentlemen have contributed full details of processes in their special departments of study. The work is to embrace the following subjects: Some account of botanical excursions, their uses and methods ; a description of the collector's outfit; field-work, how performed; closet-work and care of herbarium; correspondence and exchanges; and some account of public herbaria and museums of vegetable products. Apparatus will be fully illustrated. The work will be placed at so low a price as to bring it within the reach of all; but, as a further inducement, the publisher offers a discount of 10 per cent. from the prospective price of $1.50 to all who subscribe before the book is published.

§ 31. **Proceedings of the Torrey Botanical Club.**—The regular monthly meeting of the Club was held at the Herbarium, Columbia College, Tuesday evening, Feb. 8th. In the absence of the presiding officers the chair was occupied by Mr. J. D. Hyatt. There were present eighteen members and two visitors.

Mr. Britton read an interesting communication from Mr. H. H. Rusby, giving a sketch of the general character of the flora of New Mexico.

Plants Exhibited.—Mr. Wright exhibited a beautiful collection of Australian ferns which were sent by Mr. Chorlton for the Club's herbarium. Mr. Gerard exhibited an example of *Heterophylly in Hepatica.*—The leaf shown was one of several similar ones taken from the same plant, and each of which possessed a like peculiarity—the middle lobe being deeply trilobate and the lateral ones bilobate (as seen in the annexed figure), thus making an approach toward the leaf-forms found in the genus *Anemone* into which the old genus *Hepatica* is now merged



Mr. Schrenk showed and remarked upon a specimen of *Silene Pennsylvanica* having a pentamerous ovary, and which is referred to at more length on another page of the present number.

A note from Mr. O. R. Willis was read, stating that the biographical sketch of the late Prof. Wood in course of preparation by him would be presented before the Club at the next meeting.

§ 32. **Ferns of New Mexico.**—For the benefit of lovers of ferns, we give the following list of the 14 species which are comprised in the sets now being distributed by Mr. Henry H. Rusby. The specimens were collected in Grant County, New Mexico, during the fall of 1880, and no pains have been spared by Mr. Rusby to have them complete, perfect, beautiful and ample. Those of our friends who have purchased sets are highly pleased with them. *Gymnogramme hispida*, Mett., *Notholaena sinuata*, Kaulfuss, *N. Hookeri*, D. C. Eaton, *N. dealbata*, Kunze, *Cheilanthes Wrightii*, Hook., *C. lanuginosa*, Nutt., *C. Eatoni*, Baker, *C. Fendleri*, Hook., *C. Lindheimeri*, Hook;, *Pellaea atropurpurea*, Link, *P. Wrightiana*, Hook., *P. andromedaefolia*, var. *pubescens*, Baker, *P. ternifolia*, Link, and *Woodsia Oregana*, D. C. Eaton, variety.

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§ 33. **Fresh-Water Algae. V.**

By Francis Wolle.

In making a brief record of the results of another summer among those humble, yet often marvellously beautiful microscopic plants—the Fresh-Water Algae, I gratefully refer to the valuable aid furnished by a number of contributors, the names of some of whom occur in the list below. Among others, this year, I am especially indebted to F. H. Hosford, assisted by C. G. Pringle, who proved himself an indefatigable collector. Vermont was never so searched out before. Among the large collections of Capt. J. Donnell Smith in Florida, in 1879, I was delighted to find a number of Desmids which were overlooked on the first examination. It is gratifying to notice a gradually-awakening interest in this study, for a large field yet remains to be explored. Every research brings out some new plant, or throws some new light on the life-history of species already known.

Last year, the literature of this subject received some valuable additions, a passing notice of which will suffice here. N. Wille contributed a review of the *Chlorophyllaceae* of Norway ; a paper on the cell-division of *Confervaceae*; and another on a new genus of *Algae*. Paul Petit, of France, published a paper on the trichogyne of *Hildenbrandtia rivularis*, and an illustrated prodromus of the *Spirogyrae* of the environs of Paris. Paul Richter published an able paper on the forms and manner of development of the cells of *Gloeocystis*, but did not exhaust the subject. In a more recent article he questions the possibility of unicellular Phycochromes changing their generic character. This is of special interest as an endorsement of the more advanced views on the subject. Wittrock and Nordstedt, of Sweden, have issued two more fasciculi (the 17th and 18th) of their "Exsiccatae," each containing fifty-five specimens of dried Algae beautifully arranged, one kind on a page, in book form.

The plants in the following list are, with few exceptions, new to the recorded Alga-flora of the United States.

PHYCOCHROMOPHYCEAE.

SYNECHOCOCCUS, Naeg.—This genus embraces a number of the many forms which probably belong to an intermediate developing condition in the life of fresh-water algae. I add another species, which may have no more claim as a distinct plant than the others. It is a distinct form, however, and until its relations shall be determined it may be recorded as

SYNECHOCOCCUS RACEMOSUS, *n. sp.*—S. amorpho aeruginoso; cellulis minutissimis saepius regulariter perpendiculare densis aggregatis, oblongo-cylindriceis utroque polo rotundato, diametro (.00008") duplo, triplo, raro quadruplo longioribus; cytioplasmate homogeneo laete aeruginoso. Hab. Glass sides of aquarium.

The size of the cells, the bright-aeruginous color and particularly the vertical arrangement of the cells, so as to form a dense stratum, separate this species from all other described forms.

PHORMIDIUM, Ktz.—*Ph. membranaceum*, Ktz., and *Ph. interruptum*, Ktz. Two forms collected by F. H. Hosford in Vermont.

MICROCOLEUS, Desmaz.—*M. lacustris*, Rab. Hab. Pond, Atsion, N. J.

LYNGBYA, Ag.—*L. aestuarii*, Jurg. Hab. Ponds of submarine waters, Dennisville, N. J.

RIVULARIA, Ag.—*R. radians*, Thur., var. *minutula*, Kirch. Collected by Dr. Hobbe in a lake in Minnesota, July, 1880. He reports it "very abundant, covering the surface of the lake for a considerable extent. The natives consider it to be grass-seed washed into the lake." The thalli are in size like small poppy-seeds. Cohn describes a similar appearance on a lake in Silesia. He says that the thalli appear in masses resembling the spawn of fishes.

ISACTIS, Thur.—*I. fluviatilis*, Rab. Collected by F. H. Hosford, Vermont, from pebbles and stones on the borders of lakes. Found also in Green Pond, N. J.

SCYTONEMA, Ag.—*Sc. gracile*, Ktz, var. TOLYPOTRICHOIDES, *n. var.*, Witt.: Pseudoramuli plerumque solitarii; heterocystae et basilares et interjectae. Diam. fil. 13μ—21μ. Hab. In Morris Pond, N. J.

Represented in Wittrock and Nordstedt's "Exsiccatae," No. 389.

Sc. cincinnata, Thur. This plant has been previously noticed as *Lyngbya cincinnata*, it having appeared to the describer of the species, Kutzing, of Germany, to belong to that genus. Thuret found the same plant in France, but called it a *Scytonema*. Kirchner collected it in Silesia, and finding the generic character of neither *Lyngbya* nor *Scytonema*, made a new genus—*Chrysostigma*—to include this particular plant. Each quotes the plant of the other authors, implying that they did not see correctly. The fact is that all were right, but that each saw the plant in different conditions. I find the plant in a pond near by. Sometimes it may be classed with one, and then again with the other genus. Its usual appearance is that of a *Lyngbya*, but sometimes it assumes the form under which Kirchner saw it, and at other times it is a perfect *Scytonema*, with yellow heterocysts and single and double branches.

CALOTHRIX, Ag.—*C. radiosa*, Ktz., var. *fuscescens*, Ktz. Collected by F. H. Hosford in Vermont. *C. Orsinianum*, Thur. New Jersey and Pennsylvania.

CALOTHRIX HOSFORDII, *n. sp.*—C. strato olivaceo, trichomatibus aggregatis, laete aerugineis, subdichotomo-fasciculato-pseudoramosis, flagelliformibus, in basi crassis (.001″) in apice hyalinis longe cuspidatis, leniter flexuosis; articulis diametro triplo-quadruplo brevioribus; vaginis crassis, distincte lamellosis; in basi luteis sursum achrois hyalinis; cellulis perdurantibus basalibus singulis subhemisphericis, trichomatibus diametro subaequalibus. Diam. trich. s. vag. .0004″—.0005″; vag. ad .001″—.0012″. Collected by F. H. Hosford in Vermont.

This plant is nearest to *Calothrix* (*Schizosiphon*, Ktz.) *Meneghi-*

ana, Ktz., but differs in the size of the filaments, which are usually twice the diameter, and in the articulations, which are one-half the length.

CALOTHRIX LACUCOLA, *n. sp.*—C. natans, fuscescens, trichomatis pseudoramosissimis; ramis subpatentibus, non concretis, modice attenuatis, apice obtusis, leniter curvatis, elongatis, laxissime intricatis; internis sordide aerugineis vel fuscescentibus, homogeneis vel indistincte articulatis; articulis diametro aequalibus ad duplo triplove brevioribus; vaginis arctissimis achrois vel luteolis; cellulis perdurantibus globosis, luteis, plerumque singulis, ad pseudoramulorum basim, trichomatibus diametro aequalibus. Diam. max. cum vag., a basis .0006″—.0008″ (15μ—20μ). Hab. Splitrock Pond, N. J.

This form appears to be very distinct. It bears a resemblance to *Tolypothrix* in the mode of branching, but is unlike the plants of that genus in having the filaments moderately attenuated from the base to the apex.

HAPALOSIPHON, Naeg.—*H. Brebissonii*, Ktz., and *H. tenuissimus*, Grun. Hab. Ponds at Dennisville, N. J.

SIROSIPHON, Ktz.—*S. coralloides*, Ktz. I once received a very small specimen of this plant from the late C. F. Austin, but now discover the same form in abundance on stones along the shores of Green Pond, N. J. When remoistened, it emits a strong fragrance of orange or jessamine-blossoms—a peculiarity not noticed in any other species of this genus, but not unlike that observed in the *Chroolepus*, found on the Swiss mountains and known as the "veilchenstein."

CHLOROPHYLLOPHYCEAE.

COELASTRUM, Naeg.—*C. sphaericum*, Naeg., and *C. microporum*, Naeg. Hab. Ponds, New Jersey and Pennsylvania.

PANDORINA, Bory.—*P. morum*, Bory.

PENIUM, Bréb.—*P. Brebissonii*, Ralfs, and *P. polymorphum*, Perty. Hab. Ponds, New Jersey.

CLOSTERIUM, Nitsch.—*C. decorum*, Bréb., and *C. Ralfsii*, Bréb. Hab. Ponds, Atsion, N. J.

DOCIDIUM, Bréb.—*D. dilatatum*, Cleve.

COSMARIUM, Corda.—*C. venustum*, Bréb.; *C. pusillum*, Bréb.; *C. quadrangulatum*, Hass.; *C. exiguum*, Archer; *C. nasutum*, Nordst.; *C. elegantissimum*, Lund; *C. pseudopyramidatum*, Lund; *C. subspeciosum*, Nordst.; *C. variolatum*, Lund. The last four species were collected by Capt. J. Donnell Smith in Florida. *C. sexangulare*, Lund. New Jersey. *C. trachypleurum*, Lund. Pennsylvania. *C. pycnochondrum*, Nordst., collected by C. G. Pringle, in Vermont.

CALOCYLINDRUS, DeB.—*C. curtus*, Bréb.; *C. Cucurbita*, Bréb.; *C. Palangula*, Bréb.; *C. pseudo-connatus*, Nordst. Pennsylvania and New Jersey.

EUASTRUM, Ehrb.—*E. intermedium*, Cleve. Dennisville, N. J.

MICRASTERIAS, Ag.—*M. Baileyi*, Ralfs, and *M. Torreyi*, Bailey. Splitrock Pond, N. J.

These two forms were recognized by Prof. Bailey thirty years ago, but have probably not been rediscovered since. The latter species is our largest form in this genus. *M. fimbriata*, Ralfs, var. *apiculata*, Meneg, and *M. papillifera*, Bréb. Atsion, N. J.

STAURASTRUM, Meyen.—*St. trifidum*, Nordst.; *St. Brasiliense*, Nordst.; *St. senarium*, Ehrb.; *St. quadrangulare*, Bréb.; *St. aculeatum*, Ehrb.; *St. setigerum*, Cleve.; *St. Manfeldii*, Reinsch; *St. rotula*, Nordst.; and *St. Meriani*, Reinsch, var. *minus-pentagonum.* These nine forms were collected by Capt. J. Donnell Smith in Florida. *St. rugulosum*, Bréb. Pennsylvania. *St. Ophiura*, Lund; *St. arcuatum*, Nordst.; *St. Haaboeliense*, Wille; and *St. gemmatum*, Nordst. New Jersey. *St. terebrans*, Nordst. Pennsylvania and New Jersey.

ARTHRODESMUS, Ehrb.—*A. divergens*, Rab., and *A. jubulatus*, A. Br. Collected in Florida by Capt. J. Donnell Smith.

XANTHIDIUM, Ehrb.—*X. asteptum*, Nordst., and *X. antelopaeum*, var. *polymazon*, Nordst, and var. *triquetrum*, Nordst.—the latter finely in fruit. Pennsylvania.

SPIROGYRA, Link.—*S. punctata*, Cleve. Atsion, N. J.

ZYGOGONIUM, Ktz.—*Z. anomalum*, Hass., var. CRASSUM, *n. var.* In measurement near *Z. crassum*, Ktz., but having the sheath of *Z. anomalum.* Diam. .0025″—.0026″; arts. 1–3 diameters.

CONFERVA, Link.—*C. amoena*, Ktz. Mountain streamlet, Pennsylvania. *C. laeve*, Ktz. Madison Lake, Wisconsin. Collected by Rev. H. D. Kitchel.

RHIZOCLONIUM, Ktz.—*R. Julianum*, Ktz. Connecticut and Massachusetts.

OEDOGONIUM, Link.—*OE. Franklinianum*, Witt. For diagnosis *vide* No. 309 of Wittrock and Nordstedt's "Exsiccatae." Collected in Franklin Pond, New Jersey. *OE. stagnale*, Ktz. Bound Brook, N. J. *OE. zigzag*, Cleve, and *OE. acrosporum*, DeBy. Pennsylvania.

BULBOCHAETE, Ag.—*B. rectangularis*, Witt. Pennsylvania. *B. nana*, Witt. Pennsylvania and New Jersey. *B. mirabilis*, Witt. New Jersey.

MICROTHAMNION, Naeg.—*M. Kutzingianum*, Naeg. Water-troughs, etc. Pennsylvania.

DRAPARNALDIA, Ag.—*D. spinosa*, Ktz. In streamlet, Glen Onoko, Pa.

ENTOCLADIA, Wille.—*E. Wittrockii*, Wille. Parasitic on aquatic plants.

ULOTHRIX, Ktz.—*U. Lenormandi*, Ktz. This is a submarine plant and was collected by C. G. Pringle, at Presque Isle Lower Canada. It is nearly related to *Hormotrichum* (*Ulothrix*) *Youngeanum*, *H. Carmichaelii*, etc. It presents a peculiar character in the longitudinal division of the cells of some of the filaments, which divide and re-divide a number of times. Normally, there should be only one row of cells in each sheath; but specimens are found having from two to ten rows. In such a case the sheath widens at each division. A similar, seemingly abnormal appearance is often observed in a *Ulothrix* (*Hormidium*) found in Sweden. In this case, the division continues indefinitely until the leaf-like form (known as *Prasiola crispa*) is produced. The question is, what is *Ulothrix* under such circumstances? Is it not an undeveloped form of *Prasiola?*

RHODOPHYCEAE.

PORPHYRIDIUM, Naeg.—*P. cruentum*, Ag. Not infrequent on moist earth and on shaded pavements.

Trees

§ 34. **A Simple Dendrometer.**—This instrument is constructed essentially as follows: A tube, *t*, about two inches in diameter, and nearly or quite a foot in length, is supported in a vertical position by two pins, *pp*, near its upper end; and these pins rest upon a ring, *r*, forming a simple gimbal which allows the tube by its own weight to assume an exactly vertical position. In the lower end of the tube two mirrors, *A* and *B*, are placed side by side, each occupying one half of the section of the diameter of the tube. One of these mirrors (*A*) is inclined at an angle of 45° to the horizon when the tube is in a vertical position, and the other (*B*) has an inclination of 22½°. One side of the tube is properly cut away (as shown in the accompanying figures) so that when it is held vertically the mirror *A* shall transmit to the eye (at *c*) at the top of the tube, the horizontal ray *a*, and the mirror *B*, the ray *b*, which makes an angle of 45° with the horizontal.

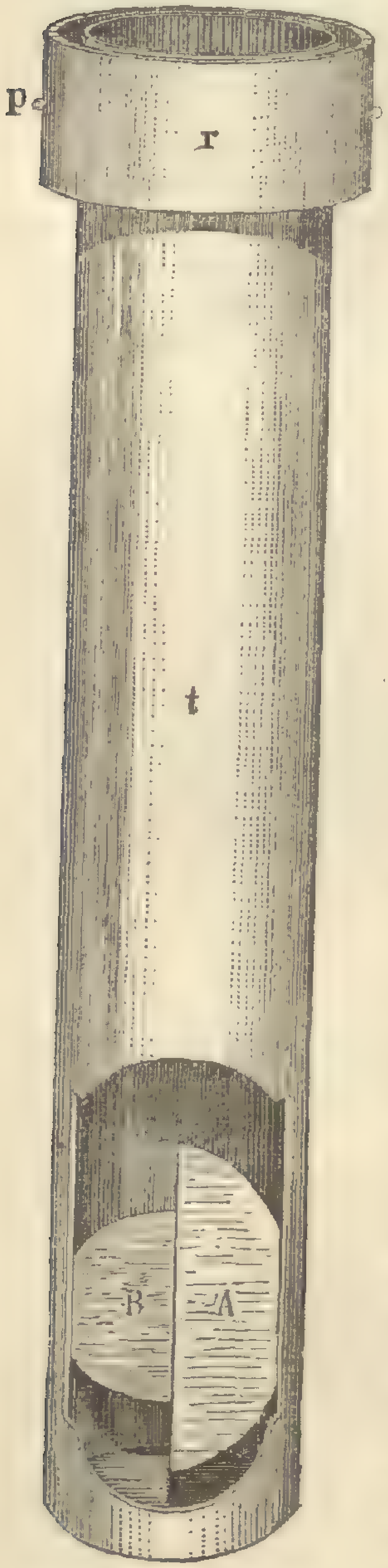

Fig. I

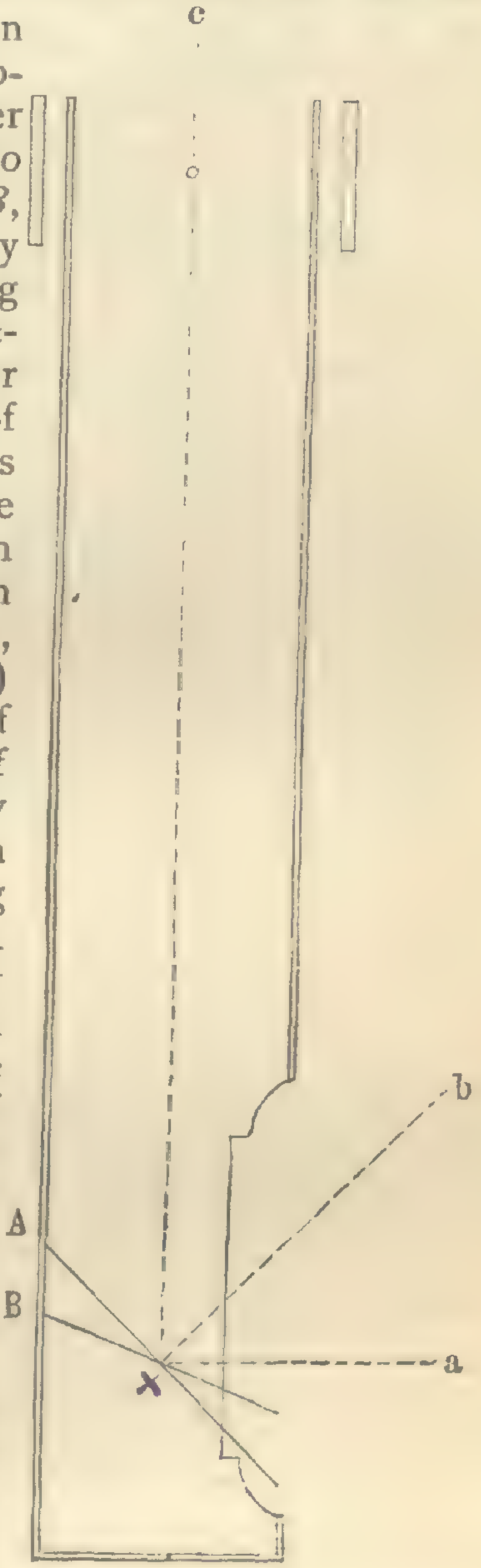

Fig. 2.

The method of using the instrument is simple. By holding the supporting ring, *r*, in the hand in the proper position, the centre of the mirror *A* can easily be brought into the same horizontal line as the base of the tree (represented by *a*); then, by moving towards or away from the tree, its apex (represented by *b*) may be brought into view as it is reflected to the eye (*c*) from the mirror *B*. When both apex and base of the tree are seen at the same instant, the distance from the instrument to the tree along the horizontal line *x–a* is equal to the altitude of the tree.* A simple measurement of this horizontal, by pacing the distance, or by other means, thus gives the height of the tree.

Fig. 1, front view of the instrument. Fig. 2, vertical section of the same, side view.

Ames, Iowa. C. E. BESSEY.

§ 35. The Herbaria and Botanical Libraries of the United States. V.

HERBARIUM OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.—The Academy of Natural Sciences, of Philadelphia, was founded March 21st, 1812, by a few citizens "interested in the study of the works and laws of the Creator." From the outset, the department of Botany received a due share of attention, and the first contribution to the Academy's Herbarium consisted of a collection of plants made in the environs of Paris and presented by Nicholas S. Parmentier, and still in excellent preservation.

During the years which followed, this little nucleus received constant accretions from the working botanists of the day, and the names of Collins, Elliott, Pursh, Baldwin, Leconte, Conrad, Nuttall, Torrey and Pickering are noted upon many of the early tickets of the Herbarium.

In 1834, the Academy received the bequest of the collections made by Rev. Lewis David Schweinitz during a period of forty years. Most of the North American species were collected by himself, but many came from Dr. Torrey, Major Leconte, Rev. Mr. Dencké, and other correspondents. The European species were contributed by Weldon, Bentham, Brongniart, Schwaegrichen, Steudel and Zeyher. The Siberian plants were furnished by Ledebour, and those of India by Wallich and Steinhauer. Many Chinese species were collected by Mr. James Read; and from the arctic regions were plants collected by the navigator Parry, and received through Sir William Hooker; while from South America were rich collections made by Von Martius, Huffel, Hering and Baldwin. But perhaps the most valuable portion of the bequest consisted of the extensive series of the lower cryptogams, of which Schweinitz had made a special study.

Other valuable contributions followed the bequest of Schweinitz, among which may be specified the Poiteau collection of St. Domingo plants; Chilian plants from Dr. Styles and Dr. Ruschenberger; Nuttall's collections made in his expeditions to Arkansas, Oregon and the Sandwich Islands; Menke's herbarium of 7,000 species of European plants derived from Thunberg, Sprengel, Bernhardi, Treviranus, Mertens, etc.; the Ashmead collection of marine algae; Lesquereux's collection of over 700 species of algae, authenticated by the best algologists of the age, and a large collection of cryptogams from Ravenel.

More recent additions are the herbaria of the late Thomas G. Lea, of Cincinnati, and of Dr. Joseph Carson, late Professor of Materia Medica in the University of Pennsylvania; a large collection from Southern Europe and from India, made by the late John Stuart

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* The letter *x*, omitted by the engraver, is supposed to be at the point of intersection of the lines *a*, *b* and *c*.

Mill, received from Miss Taylor through the Director of the Kew Gardens, and the kindness of Dr. Gray; the collections of the late Dr. Charles Pickering made in his journeyings through oriental regions in 1844 and 1845; Syrian and Algerian plants from Dr. Geo. E. Post, of Beirut; Floridan plants from Dr. Garber; Mexican plants collected by Parry and Palmer; and a set of the mosses and hepaticae of North America, collected and named by the late Coe F. Austin.

But the most important accession to the Academy's Herbarium is yet to be mentioned. After the death of Dr. Charles W. Short, of Louisville, Ky., in 1863, the splendid collection of American and exotic plants which he had accumulated and arranged in sumptuous manner, became the property of the Academy, on condition that it should be kept distinct and apart, and open to the inspection of botanists, under the name of the "Short Herbarium." For this, the Aademy was indebted to the strenuous exertions of Dr. Gray in its behalf, and to the liberality of Dr. Short's family. The plants of this collection are uncommonly choice specimens, from all the active collectors up to 1863, and are laid in sheets of extra size, arranged in 325 book-form cases, of which the North American species occupy 261, and the exotic species 64. Even without the restriction under which this collection was received, there would have been abundant reason for keeping it apart, sacred to the memory of the accomplished botanist who formed it, and to whom Dr. Gray dedicated the rarest and one of the most beautiful of North American genera.*

The work of arranging the earlier collections of the Academy, was mainly accomplished by Nuttall and Pickering, followed later by Goddard, Bridges, Zantzinger, Durand, Burk, Meehan, Redfield and Scribner. Until the removal to the new building, in 1876, the arrangement had been after the Linnaean system, in large cumbersome port-folios, in a narrow, dark and inconvenient hall. The removal gave opportunity for entirely new arrangement, more in accordance with the progress of the science, on enclosed shelves after the most approved modern methods, and in well-lighted apartments convenient for reference and study. The work of mounting the plants upon standard paper has been begun.

In 1854, the lamented Elias Durand began the work of forming a special North American Herbarium from the stores of the Academy, contributing largely from his private collection, of species collected by Lindheimer, Fendler, Wright and others. In this labor he was occupied for four years. Since his death the work of perfecting this department has been continued, and nearly all of the collections made in our newer territories by Parry, Lemmon, Palmer, Kellogg, Ward, Rothrock and others have been contributed at various times by Gray, Canby, Parker, Meehan, Rothrock, Martindale and Redfield. This collection and the "Short Herbarium" occupy the upper of the two rooms devoted to Botany, while the lower room contains the General Herbarium, and a large case devoted to the reception of fruits, seed-vessels and other vegetable productions.

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*For a tribute to the botanical labors of Dr. Short, and some further account of his herbarium, see Dr. Gray's obituary notice in the *Amer. Journ. Sci.* 2d series, Vol. xxxvi., p. 130, Nov. 1863.

All these collections are now in charge of the Botanical Section of the Academy. Their chief value lies in the large number of species from early collectors, and of type specimens of early authors. Most of Nuttall's early species are deposited here and have been the vouchers used by Torrey and Gray in deciding upon their specific validity. Schweinitz's own types of his new fungi, lichens, etc., are here, as well as many of the types collected by Bigelow and others in the Whipple Exploration, bearing tickets in the beautiful chirography of Dr. Torrey.

So old a collection, much of it running back for sixty or seventy years, might be expected to have suffered from the ravages of insects, and from the crumbling effects of time. Some portions have, indeed, thus suffered, but careful attention and thorough poisoning have kept this destruction within narrow limits. Many of the species from tropical regions have remained undetermined, and are in fragmentary condition. Dependent as the Academy has mainly been, upon volunteer and occasional supervision, it has been impossible fully to determine all new accessions, or even properly to care for the old. All should be carefully worked over, the redundancies sifted out, the hiatuses filled, and the work of mounting carried on to completion. It may be hoped that ere long some public-spirited individual will be incited to make an endowment that shall provide for this and other needed botanical work.

It is always difficult to ascertain the number of species in a large herbarium, and estimates are apt to be excessive. In collections received from many sources, there will of course be a large amount of duplicating. Doubtful, imperfect and undetermined specimens increase the difficulty, and the varying ideas as to the true circumscription of specific limits add another element of doubt. The Academy's Herbarium has been estimated to contain as high as 70,000 species, an estimate made doubtless without proper regard to the large number of species common to the several collections of which it is made up. Recent estimates, based on portions which have been carefully worked over, would give the number as not less than 40,000, nor more than 45,000 species.

In preparing this notice, free use has been made of the history of the Academy's progress and condition, prepared by Dr. Ruschenberger, who has been for nearly fifty years one of its most active members, and for the last eleven years its presiding officer.

J. H. R.

§ 36. **Rooting at the Tips of the Branches.**—According to *Nature* of Dec. 23d, Francis Darwin read a paper before the Linnean Society, Dec. 16th, on "The Theory of the Growth of Cuttings, illustrated by Observations on the Bramble, *Rubus fruticosus.*" His experiments indicated that root-budding took place generally at or near the tips or distal ends, rather than at or near the basal ends of the branches, and he evidently deduces therefrom the fact that for the plant it is better that it should perpetuate itself by thus rooting at the tip-ends of the branches. As this is so contrary to the belief and the practice of all horticulturists, I think one should hesitate to formulate such observations, in order that science may not be brought to do mischief. It will be in point if I mention a practical instance or two. When the Delaware grape-vine first came into market, I bought a young vine. It had a large root, but it was a cutting from the tip-end of the branch. The cupidity of the trade spared no part of the branch in making cuttings. The result was that after nursing my vine for several years, it was still a worthless, feeble plant. At the time of the introduction of the Lawton blackberry, a farmer not far away raised a plantation of the canes, and offered them for sale at a round price, from which he would not deviate. A farmer bargained with him at a fixed price per thousand for a part of the plantation. This was in spring. It was agreed that the plants, without any extra cost to the buyer, should be allowed to stand until fall, till which time the purchaser should be allowed to do anything he pleased to or with the plants. In a word, he bought that part of the plantation. To the dismay of the dealer, his patron came at the proper time with an immense number of little forked sticks; and, taking one of them in one hand and bending down the tip-end of a cane with the other, he pinned it firmly to the ground. This was done with his entire purchase. He then advertised a stock of Lawtons for sale in the fall, mixing the feeble plants begotten from the tips in with the stronger ones. I heard that this bit of sharp practice proved a good "spec." The original planter in his chagrin declared it a "*tip-top* fraud."

Freehold, N. J. SAMUEL LOCKWOOD.

§ 37. **Plants and Plant-Stations.**—A station for *Zygadenus glaucus*, Nutt., in Central New York, given in the September number of the BULLETIN, recalls another locality, Mumford, Genessee Co., in the western part of the State, where this and other interesting plants may be found. While passing a few days in the vicinity, in the summer of 1879, a visit to the fish-breeding station of the New York Fish Commission led to my botanizing in the adjoining woods and marsh. Some remarks on the flora, and a comparison of the habits of a few plants with what I have seen in other localities, may prove of interest to the readers of the BULLETIN. It was like being placed in some familiar spot in the Northwest, farther up the St. Lawrence System, and such as may be found in the north part of Michigan. At Mumford there is a cedar swamp, through which runs a stream of clear, cool water called Spring Creek. This starts from large springs at Caledonia, a short distance above, and is fed by numerous little streams from springs which burst out of the limestone ledge or ridge to the south of it. Its course of about three miles is mainly along by or through the swamp to its outlet in the Oatka, where, as well as at Caledonia, it furnishes the water for several mills. This cool stream is the natural home of the speckled trout, and the waters from it and the rills from the rocks of limestone have deposited in the bogs and swamp an abundance of travertine, thus in some places partially drying the ground. Hence a varied flora. One finds the living plant, and, if geologically inclined, can dig into the rocks of travertine and find it fossilized.

Zygadenus glaucus, of which but few specimens were found, grew by the margin of the creek. This contrast in habitat and surroundings, with those of localities where I had found it at Petoskey, Mich., by the shore of Little Traverse Bay, could not fail to be noticed. While collecting in different parts of the country, I have frequently met with like surprises, such as finding *Cypripedium spectabile* on hillsides or hill-tops, in Southeastern Minnesota, or *Lobelia Kalmii* on the rocks at Niagara Falls, but, on the contrary, in wet sands near the south end of Lake Michigan. At Petoskey, *Z. glaucus* grows in the dry sand, close by the sand-ridges made by the winds along the shores of the bay. It is on the edge of a forest of pines (*Pinus Strobus* and *P. resinosa*), and its smaller neighbors are such plants as *Campanula rotundifolia*, L., var. *linifolia*, Gray, *Vaccinium Canadense*, Kalm, (the form which approaches *V. Pennsylvanicum*) and the characteristic plants of pine woods. Close by, in the more shifting sands of the shore, grow *Triticum dasystachyum*, Gray, *Cirsium Pitcheri*, Torr. and Gray, *Solidago Virga-aurea*, L., and *Juniperus Sabina*, L., var. *procumbens*, Pursh. The *Cirsium* and the *Solidago* grow together in the sands at the head of the lake, but the *Zygadenus* I do not find. Gray's Manual gives Bergen Swamp, Genesee Co., a cedar swamp about ten miles west of Mumford, as a station for *Z. glaucus*.

Another plant of interest, for these and other reasons, was *Parnassia Caroliniana*, Michx., growing on the thin soil of rocks and fallen timber by the water-side. At Englewood, just south of Chicago, it is abundant on the sandy and originally wet prairie, which is now dry through drainage. It is very common in the sandy ground beside the "sloughs" in the pine barrens of Indiana, at the south end of Lake Michigan. In Northern Michigan I have found it under conditions similar to those near Mumford—by the borders of streams in cedar swamps, or rooted in the soil of fallen timbers which span, and in places, almost conceal from sight the streams of cold water. Its companions there were such plants as *Valeriana sylvatica*, Richards, *Cystopteris bulbifera*, Bernh., (with fronds often two or three feet long), *Halenia deflexa*, Grisebach, *Moneses uniflora*, Gray, *Mitella nuda*, L., and such mosses as *Meesia uliginosa*, Hedw., *Mnium serratum*, Brid., *Dichelyma capillaceum*, Dill. (floating), and *Hypna* of many kinds. Fifty miles south of Chicago, at Kankakee, Ill., I have found it in the wet clay of the river banks, and among plants widely different—a common one being *Juncus Canadensis*, J. Gay, var. *coarctatus*, Engelm. At Mumford, one of its near neighbors was *Ranunculus Pennsylvanicus*, L. To enumerate all the plants that grow with it in the prairies, from *Hypoxis*, *Sisyrinchium* and the violets of spring to the Gerardias, Asters and Solidagos of summer and fall, would require quite a catalogue; and, were the pine-barren plants added, the list would be far more extended. In all these stations, widely separated, there are analogous but varied conditions. This study of a plant's company and environment is one of the most pleasing and profitable parts of collecting. How different are the plants of a cedar-swamp, a pine-barren, a prairie, a clay-bank and of a boulder of water-limestone. Yet this little plant, *Parnassia*, finds a home in each, and doubtless is to be found under many other conditions equally suggestive. It cannot be said that every plant at least is known by the company it keeps.

Another plant gathered by Spring Creek was *Potentilla fruticosa*, L., which is abundant in the swamps and wet sands by our lakes, and throughout Michigan. In the dryer places of the swamp occurred the pretty *Linnaea borealis*, Gronov., which is common across the lake in Michigan, and also to be found at Pine Station, Lake Co., Ind., fifteen miles east of Chicago. This is the most southerly station of which I am aware for this plant, away from mountains or hills. The region at the head of Lake Michigan is a meeting-place for plants from many directions; and, in consequence, furnishes a remarkably varied and interesting flora.

Two more of the plants of Mumford called to mind the Lake Michigan flora; these were *Juncus Balticus*, Dethard,(abundant in all moist sands on or near the shores) and *J. Canadensis*, J. Gay, var. *brachycephalus*, Engelm., quite often met with here. Nor should the stations be omitted of two ferns, in localities not far away. One of these, *Camptosorus rhizophyllus*, Link, is common on ledges of limestone in the eastern part of Le Roy, Genesee Co., in the deep ravines of a forest locally known as the " North Woods." The other, *Botrychium lanceolatum*, Angstroem, is sparsely found in woods in the south part of Attica, Wyoming Co.

Englewood, Ill. E. J. HILL.

§ 38. **Note on the Round-leaved Violet.**—Mr. Robinson's "Flora of Essex County " is in error in stating that that county is the southern limit, in Massachusetts, of *Viola rotundifolia*. This plant occurs in the vicinity of New Bedford, some sixty or seventy miles further south, in a single locality, in which, within the past few years, it appears to have become more abundant.

New Bedford, Mass. H. W.

§ 39. **Apparent Parasitism of Listera australis.**—I send a few green specimens of *Listera australis*, which has been blooming since the middle of the present month (February). Last winter the plants flowered in January, I think, (Chapman says July). This plant seems almost *semi-parasitic* on *Osmunda cinnamomea*, from the *root-stocks* of which these specimens were dug.

Bluffton, S. C., Feb. 20, 1881. J. H. MELLICHAMP.

§ 40. **Woodwardia angustifolia in Michigan.**—Last September I was shown a sterile frond of a fern collected at South Haven, Mich., by Mrs. L. A. Millington, which she supposed to be *Woodwardia angustifolia*, Sm. A few days later I found a patch of the same, containing well-developed fertile and sterile fronds, in a dark, damp and forbidding hemlock forest, fourteen miles south of South Haven. It was *W. angustifolia*, the rare fern of the Atlantic seaboard. The localities where it was found were on the eastern shore of Lake Michigan, in densely shaded lowlands. Only a single isolated patch was discovered, about two feet wide by twenty long.

South Haven, Mich. L. H. BAILEY, JR.

§ 41. **The Flora of Richmond County, N. Y.**—ADDITIONS.—Since the publication of our last list, the following additional species have been noticed: *Stellaria uliginosa*, Murr., Rossville; *Malva moschata*, L., Court House; *Mimulus alatus*, Ait., Princes Bay; *Galeopsis Ladanum*, L., Staten Island (See BULLETIN, Vol. vi, p. 115); *Smilax tamnoides*, L., "Staten Island, one plant only." T. F. Allen, in 18th Annual Report State Cabinet Nat. Hist. p. 202.

ARTHUR HOLLICK and N. L. BRITTON.

§ 42. **Note on Polygonum Careyi.**—From the notice in the BULLETIN on "The Flora of Essex County, Mass.," I see that Prof. Robinson speaks of the county as being the northern limit of *Polygonum Careyi*, Olney, as well as of some other plants. If it is the northern limit of the other plants named, it is not so of the *Polygonum*, for I found it, years ago, growing in Cumberland, Me., and, later, in Gilmanton, N. H., though never but in one place in either of the towns.

Andover, Mass. JOSEPH BLAKE.

§ 43. **Botanical Literature.**—The contents of *Grevillea* for March are: 'Californian Fungi,' by M. C. Cooke and Dr. H. W. Harkness; 'Notes on British Desmids' (with two plates), by M. C. Cooke; 'New British Fungi,' by M. C. Cooke; 'On *Thelephora Lycii*,' by M. C. Cooke; 'Some Exotic Fungi' (with a plate), by M. C. Cooke; 'New Jersey Fungi,' by M. C. Cooke and J. B. Ellis; 'Reliquiae Libertianae,' by M. C. Cooke and W. Phillips; 'Fungi Macowaniani,' by C. Kalchbrenner. The editor calls attention to the fact that he has in contemplation the publication of a series of illustrations of the British Hymenomycetes. The work is to be published in parts, each consisting of sixteen 8vo colored plates, and four parts are to be issued during the year. Those who subscribe now will be able to obtain the work at a much reduced price.

In the March number of the *Botanical Gazette*, Mr. J. C. Arthur shows, by the aid of a plate, the various forms assumed by the trichomes of *Echinocystis lobata*; some new plants of New Mexico and Arizona are described by Rev. E. L. Greene; Prof. C. R. Barnes gives directions for making botanical charts; Prof. J. W. Chickering describes a new species of *Rudbeckia* (*R. rupestris*), from North Carolina; and Prof. F. L. Harvey gives a list of the ferns of Arkansas.

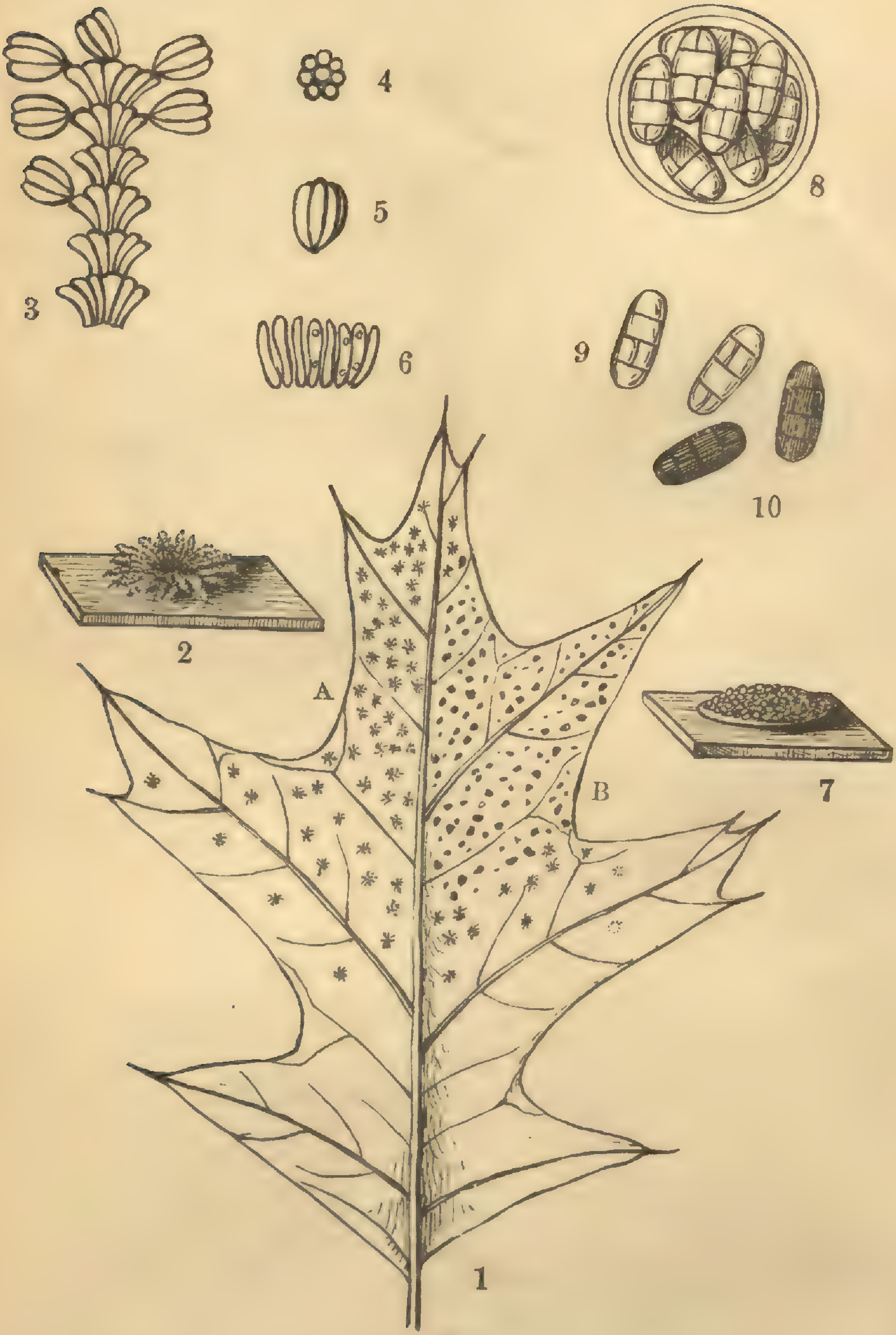
§ 44. **Proceedings of the Torrey Club.**—The regular monthly meeting of the Club was held at the Herbarium, Columbia College, Tuesday evening, March 8th, Mr. J. D. Hyatt in the chair and twenty-two members and eight visitors present.

Specimens of plants from the South were shown and commented upon by Mr. Hyatt and Miss Knight.

Dr. O. R. Willis read a "Biographical Sketch of Prof. Alphonso Wood," an abstract of which will be given hereafter.

One corresponding and two active members were elected.

ERRATUM.—On page 29, sixth line from the top, the 0 should be erased after the figures 4 and 6, so as to reduce the height of *Prunus pumila* to 4°-6°. The error was ours.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ASCOMYCETELLA QUERCINA, Peck.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VIII.] New York, May, 1881. [**No. 5.**

§ 45. Two New Species of Fungi.

By CHAS. H. PECK.

An interesting, and, so far as I have been able to ascertain, an undescribed fungus was recently sent me from Illinois. It inhabits oak leaves and occurs in two forms, one conidial, the other ascigerous. The conidial form grows in minute white tufts, having a somewhat radiate or stellate appearance, especially when viewed through a magnifying glass. These tufts occur on the lower surface of the leaf and are generally sufficiently numerous to cause the leaf to appear as if it had been sprinkled on that surface with flour. The upper surface is obscurely mottled with minute pale or yellowish spots, which are placed opposite the tufts beneath. The hyphae or flocci are compound and are composed of several somewhat obconic masses of obovate or short-clavate cells, the masses being placed one above another in a proliferous manner, and together forming a sort of short, thick, submoniliform filament or pagoda-like structure. The conidia are also in masses or tufts, which are nearly elliptical in outline, and arranged in verticels around the flocci, they being attached to the upper or thicker exterior part of the component cells. In each tuft there are usually seven, though sometimes but six, oblong or subcylindrical, slightly curved, colorless conidia, compactly arranged in a circle and forming a kind of cylinder or palisade around a single central one. Thus each tuft contains in all seven or eight conidia. This form of the fungus develops a little before the ascigerous form. In the specimens before me, some of the leaves have only the conidial form on them, others have both forms intermingled. In the latter, the ascigerous form appears frequently to have developed on the very spot previously occupied by the conidial form. The ascigerous form consists of numerous black dots or cushions scarcely broader than the conidial tufts. Both surfaces of the leaf are more or less tinged with brown in the places where these fungus dots are the most numerous. A thin, flat, pale, soft or waxy stratum or receptacle first makes its appearance. This produces numerous globose asci, which are at first pale and contain eight oblong triseptate spores, one or more of the cells of which are divided by short longitudinal septa, so that the spores might be called muriform. They are at first pale or colorless, but soon become very dark-colored, and give the black hue to the fungus dots. The asci develop in the stroma-like receptacle, but, when mature, they appear to lie upon or near the surface, and almost cover the receptacle and conceal it from view. In a few instances they become slightly longer than broad and take a somewhat ovate shape, but usually they are globose even when mature.

I know of no genus to which this fungus can properly be referred, and am therefore obliged to institute one for it.

ASCOMYCETELLA.

Parasitic; receptacle thin, flattened, soft or waxy when moist, superficial, separable; asci globose or subglobose, eight-spored; spores colored when mature; paraphyses none.

This is evidently a genus belonging to the Discomycetes, but apparently is to be classed among the lowest forms of that division. Its parasitic character and almost naked superficial asci indicate a relationship with the genus *Ascomyces*, while the presence of a receptacle, though it is but a slight one, connects it with more highly developed Discomycetes.

Ascomycetella quercina: *Conidial form.*—Hyphae tufted, colorless, compound, composed of superimposed, somewhat obconic masses of obovate cells placed side by side and bearing on the upper and outer margin of the masses verticels of conidia; conidia oblong or subcylindrical, slightly curved, colorless, .0005—.0006 of an inch long, .00016—.0002 of an inch broad, produced in subelliptical tufts or masses, .0005—.0006 of an inch long and about .0005 of an inch broad, each tuft composed of seven, occasionally six conidia, compactly placed side by side in a circle, and forming a cylinder around a central one.

Ascigerous form.—Receptacle thin, minute, suborbicular, .01—.02 of an inch in diameter, whitish or pallid; asci numerous, globose, rarely obovate, .0012—.0016 of an inch broad; spores irregularly crowded, oblong, obtuse at each end, .0008—.0009 of an inch long, .0004—.0005 of an inch broad, triseptate, some of the cells divided by short longitudinal septa, at first pale or colorless, colored when mature.

Living leaves of black oak, *Quercus tinctoria*, Union County, Illinois. September and October. F. S. Earle.

The conidial form of the species bears some resemblance externally to *Microstroma quercina*, but is very different in structure. Mr. Earle informs me that in one instance nearly all the leaves on a tree were affected by the fungus, while in another, only a few leaves. He invariably finds the two forms associated together. He does not think that the tree suffers any serious injury from the attacks of the fungus. It was first observed by him in 1879.

There has been sent to me also, from Maryland, a very remarkable species of *Polyporus*. The substance of the fresh plant, when cut, exudes a milky juice similar to that which, under similar circumstances, oozes from the wounds of *Lactarii*. The spores of this *Polyporus* are also similar in size, shape and sculpture to the spores of *Lactarii*. Inasmuch as the most obvious character of the genus *Lactarius* is the milky juice of the species, some may regard this character in a *Polyporus* as sufficient to justify the formation of a new genus. To me it seems unnecessary to found a new genus on a single character of this kind so long as it is known to exist in but a single species. When its value shall be enhanced by its known presence in other species, it may be well to consider the question. So far as can be ascertained from the published characters of *Polyporus Berkeleii*, Fr., our plant must resemble it externally, but no mention is made of a milky juice in connection with that species; and, as such a noticeable character would scarcely have been overlooked or omitted from the description, had it existed, I deem our plant worthy of specific distinction; and, partly from the dried specimens, but more from full notes and colored sketches by Miss Banning, who discovered and communicated the specimens, I have drawn up the following description:

Polyporus (Merisma) lactifluus.—Pilei growing from a common tuberiform base, variously lobed, confluent or imbricated, sometimes imperfectly infundibuliform, six to ten inches broad, subtomentose or pubescent, whitish, marked with broad ferruginous or subochraceous zones, rough with slight radiating ridges, the margin thick, obtuse, sometimes flexuous; flesh white, firm, hard when dry, and exuding freely a milky juice where cut when fresh; pores medium size, unequal, irregular, often angular or flexuous, decurrent, white, at first short with thick dissepiments, then longer with thin but entire dissepiments; spores globose, rough, .0003—.00035 of an inch in diameter. Old stumps. Near Baltimore, Md. M. E. Banning.

Explanation of the Plate.—*Ascomycetella quercina, Pk.*—Fig. 1. Leaf of black oak bearing the fungus. A. The conidial form of the fungus. B. The ascigerous form of the fungus. Fig. 2. A tuft of the conidial form magnified. Fig. 3. A stem with six of its tufts of conidia still attached, x 400. Fig. 4. Vertical view of a tuft of conidia, x 400. Fig. 5. Side view of a tuft of conidia, x 400. Fig. 6. A tuft of conidia pressed apart, showing the separated conidia, x 400. Fig. 7. A cluster of asci and their receptacle, magnified. Fig. 8. A single ascus containing immature spores, x 400. Fig. 9. Two free immature spores, x 400. Fig. 10. Two free mature spores, x 400.

§ 46. Some New Species of North American Fungi.[*]

By J. B. Ellis and H. W. Harkness, M.D.

Sphaeronema capillare, E. & H.—Perithecia capillary, black, 1″ high, slightly enlarged at the base and also at the apex; terminal globule pale; stylospores cylindric, obtuse, more or less bent or curved, with several transparent nuclei, .001′—.0015′x.0015′—.002.′

On bark of chestnut logs, Bethlehem, Pa., October.

Sporidesmium Rauii, E. & H.—Tufts suborbicular, scattered or subconfluent, salmon-colored, minute; conidia obovate, composed of many compacted, partly transparent cells, with a large hyaline vescicle at the base, about .0015′ long, with the basal cell, and .0007′—.0008′ wide. Differs from *S. moriforme*, Pk., only in color.

On bark of an old grape-vine, Bethlehem, Pa., November, 1880. E. A. Rau.

Mytilinidion Californicum, E. & H. — Perithecia conchiform, .035′ long, faintly striate; lips closely compressed at first, at length partially open; asci clavato-cylindric, .0017′x 0003′; sporidia biseriate, oblong-fusiform, yellowish, triseptate, sometimes slightly constricted at the septum, .0005′—.0006′ long.

On foliage of *Sequoia gigantea* ("Big Trees"), California. H. W. Harkness.

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[*] Continued from page 28.

SPHAERIA CONSOCIATA, E. & H.—Perithecia depressed-mammiform, .0015′ diameter, with a short nipple-like, black ostiolum; asci narrow; sporidia fusiform, acute, 2–3-nucleate, .0004′—.0005′ long, subhyaline or yellowish.

On foliage of *Sequoia gigantea*, California. H. W. Harkness.

Note: On page 27, under the description of *Fusarium Schweinitzii*, E. & H., for "Newfield, N. J.," read Bethlehem, Pa.

§ 47. **The Herbaria and Botanical Libraries of the United States. VI.**—The LAPHAM HERBARIUM.—The herbarium of the late Dr. I. A. Lapham was purchased by the State of Wisconsin and deposited in the State University at Madison. It embraces the whole range of the vegetable kingdom, with a similar treatment for all examples from the highest to the lowest, and constitutes an uniform herbarium of 24,000 specimens belonging to 8,000 species. The specimens of each species, with their labels, are placed loosely between folded sheets of white paper, a little larger than the standard size, and arranged alphabetically in colored genus-covers. The genera are distributed in strong portfolios, a portion alphabetically under the larger orders, and the remainder alphabetically under the several classes—without reference to orders. This arrangement answered well for a private herbarium, but is very inconvenient for general use. To make the collection more serviceable it is now being mounted on half sheets of heavy white paper, the specimens and labels fastened with white glue, and the sheets placed in manila genus-covers. There has been built especially for the collection, a cabinet with pigeon-holes in which the arrangement of the genera and orders will be systematic and in accordance with the latest information.

Dr. Lapham had the inborn love of preserving and accumulating valuable or curious objects which bespeaks the careful and assiduous collector. The specimens of his own gathering are exceptionally perfect and finely preserved. He indirectly did much to improve the quality of herbarium specimens in this country. Dr. Short, of Kentucky, and others also, often referred, in correspondence, to the great improvement in the specimens received, and attributed it to the good example set by Dr. Lapham, Wm. Oakes, of Ipswich, Mass., and a few others. The most active period of his collecting and exchanging was between 1830 and 1855. During this interval he made a very complete set of the plants of Wisconsin.

His earlier correspondence included nearly every American botanist and a large number of foreign ones. In many instances the correspondence was continued until interrupted by his death. Exchanges were arranged with most of his correspondents, and probably no specimens were purchased. Two very large additions, principally of European plants, were received from Dr. F. J. Jung and Dr. E. Wunderly, of Germany. A fine set of Australian plants was communicated by Fred. Mueller, of Melbourne. Many plants were received indirectly from the herbaria of Alex. Braun, of Carlsruhe, Germany, Sir Wm. Hooker, of England, and Gouan, of Montpellier, France. The largest American contributors were C. W. Short, of Kentucky, A. W. Chapman, of Florida, Wm. Oakes, of Massachusetts,

S. B. Mead, of Illinois, W. S. Sullivant, of Ohio, Wm. Darlington, of Pennsylvania, F. Lindheimer, of Texas, Geo. Engelmann,of Missouri, Wm. Boott, of Massachusetts, and T. J. Hale, of Wisconsin. Sets from the Red River of the North, collected by C. A. Hubbard, and from Texas by Berlandier, still contain many specimens not fully determined. The list of those making smaller additions is very long, and a few names only need be mentioned : Chester Dewey, John Torrey, Asa Gray, Leo Lesquereux, J. W. Robbins, Geo. Vasey and Alphonso Wood. Dr. Parry sent Colorado plants, and S. B. Buckley and M. A. Curtis Southern plants. This list of distinguished botanists will indicate the valuable character of the specimens, some of which are accompanied by the collector's comments or memoranda.

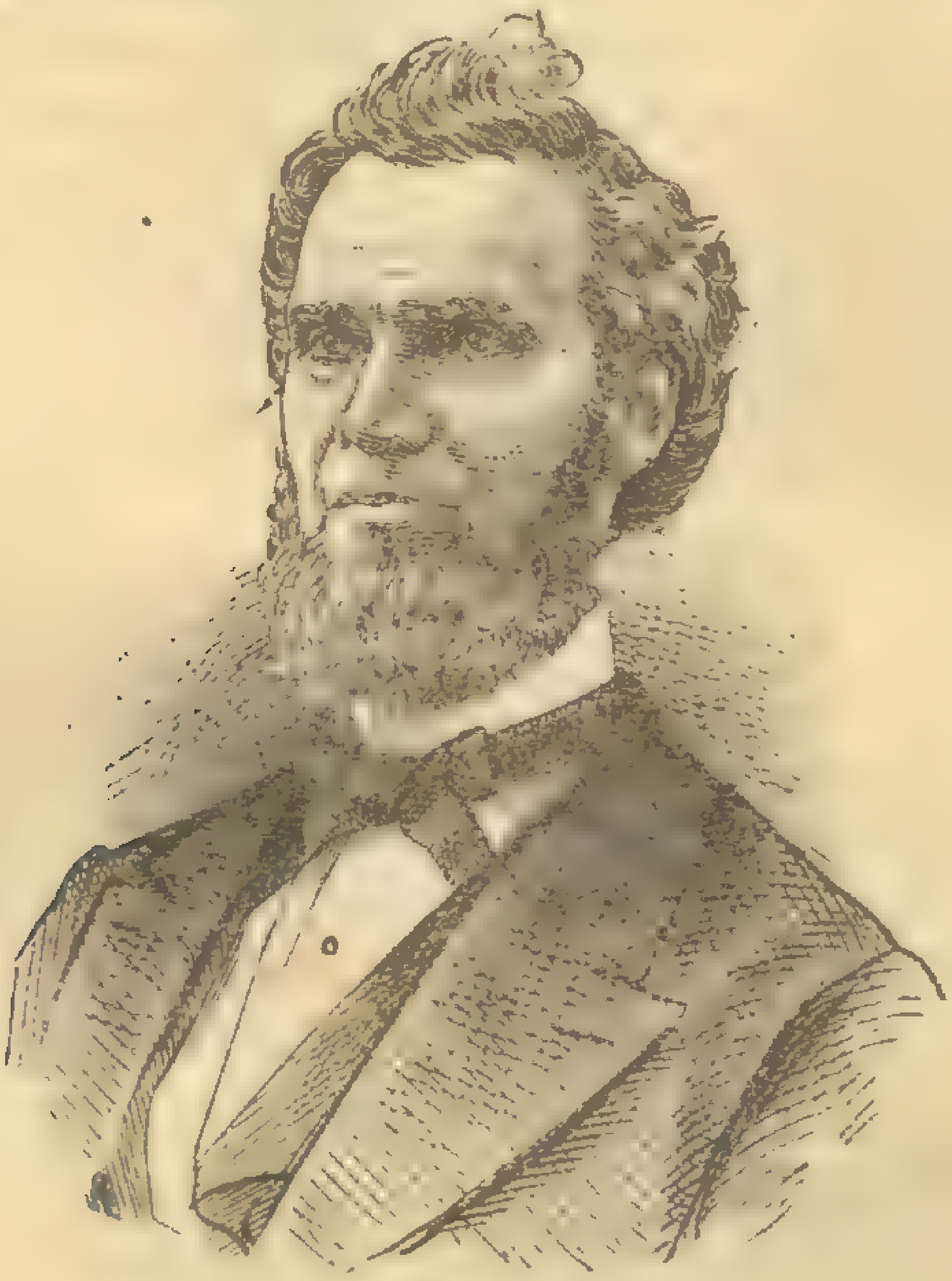
The most important series of published *Exsiccati* in the herbarium are "Herbarium Juncorum Boreali-Americanum" of Engelmann, containing 100 numbers, and "Specimina Exsiccata Muscorum" of Sullivant and Lesquereux, containing over 350 numbers. The genus *Erica* embraces 75 species, mostly from the herbarium of N. P. Sartwell, and gathered at the Cape of Good Hope. The *Characeae*, filling two portfolios, are now in the hands of Dr. T. F. Allen for verification. The herbarium is especially complete in grasses and sedges, probably the result of a study of these orders in preparing his volume on the "Gramineae of the United States." This work, which still remains in manuscript, was begun under the direction of the U. S. Patent Office, but for some unexplained reason was summarily interrupted by the Commissioner. Some idea of the fulness of the remainder of the collection may be conveyed by stating that the genus *Ranunculus* contains 83, *Aster* 123, and *Solidago* 117 specimens, representing nearly as many species.

This, like many large private herbaria, has been greatly injured by insects. Even at the present time no provision is made to have their ravages checked, although it is known that the whole collection is badly infested. Besides the herbarium proper there is a large number of duplicates intended for exchanges, which are mostly in good condition.

I take pleasure in acknowledging my indebtedness for information regarding Dr. Lapham's botanical labors to members of his family, and especially to his daughter, Miss Julia A. Lapham.

Madison, Wis. J. C. ARTHUR.

§ 48. **Alphonso Wood.**—In the death of Alphonso Wood, which occurred at his residence in West Farms, N. Y., Jan. 4th, 1881, Natural History loses an enthusiastic, hard-working devotee, and the Torrey Botanical Club one of its most useful and respected members. Prof. Wood was born in Chesterfield, N. H., Sept. 17th, 1810, and was consequently at the time of his death in the 71st year of his age. His ancestors emigrated from England eighteen years after the landing of the Pilgrims, and settled at Concord, Mass., in 1638. He was the sixth remove from William Wood, the founder of the family in America. His boyhood up to the age of 15 was spent at home on the farm, where he divided his time between rural employments and attending the village school and academy. Subsequently, his winters were occupied in teaching in village schools and carrying on his own studies. At the age of 20, having been trained to self-reliance, he entered the sophomore class in Dartmouth College, from which he was graduated with honor in 1834. On account of his scholarly attainments at college, he was invited, after his graduation, to accept the position of instructor in Latin and natural history in the Kimbal Union Academy, at Meriden, N. H., where, with the interruption of one year only, he remained for fifteen years. This year of absence he spent at Andover, Mass., in the study of theology. Soon after this he was licensed, after examination, to preach the Gospel, but his ministry was never more than an occasional service among neighboring churches, in connection with his labor in the Academy. It was during his residence at Meriden that he first conceived the idea of



ALPHONSO WOOD.

preparing a text-book of botany, and this idea arose, first from his great fondness for the science, and secondly from his want, as a teacher of natural history, of a suitable work. The botanical text-books then extant were Eaton's Manual, Mrs. Lincoln's Botany, Bigelow's Florula Bostoniensis and Torrey's Compendium—all on the Linnean system. Dr. Beck's work, on the natural system, was not suited for class instruction, owing to the paucity of information in the introductory part. Dr. Gray's text-book was too voluminous and learned, and contained no flora. Prof. Wood visited Dr. Gray and suggested that the latter should prepare a more elementary work; but Dr. Gray either did not think such a book was then needed or had no time to devote to its preparation. Prof. Wood then determined to set about the preparation of a small book for use in his own classes. He contemplated nothing more than a pamphlet or small local flora on the plan of that of Bigelow, but according to the natural system, and preceded by an introduction to contain the elements of the science, with analytical tables. As he proceeded, the work grew on his hands, and, after ten years of preparation, collecting of materials and teaching from the manuscript, the "Class Book of Botany" was put into the hands of the printer. The work, being an experiment, was not stereotyped, and only 1,200 copies were printed. An unexpectedly great demand soon exhausted this edition. In preparing for a new edition, the author passed the spring and summer of 1846 in the Western States (whither his parents had then removed), botanizing on prairies and in barrens,in order to extend the limits of his flora as far west as the Mississippi River. Having impaired his health by close attention to his duties, Prof. Wood was advised by his physician to seek some active out-door employment Acting on this advice he resigned his professorship in the Kimbal Union Academy, and sought and obtained the position of chief engineer in the construction of a railway from Rutland. Vt., to Albany, N. Y. On the completion of this road, in 1852, he removed with his family to Cleveland, Ohio, where, in the Cleveland Female Seminary he resumed his profession as a teacher. Two years afterwards he disposed of his interest in the school and removed to College Hill, near Cincinnati, where he became professor in the Ohio Female College, and afterwards president of that institution. Here he passed six years; the College buildings in the meantime having been destroyed by fire, were rebuilt under his own supervision and restored to prosperity. In 1858, having transferred to others his interest in the College he resigned the presidency, and established, in connection with a friend, the Terre Haute Female College, an institution which in a very short time rose under his administration to great prosperity and usefulness. In the fall of 1860, in order to facilitate the reprinting of his books, Prof. Wood removed with his family to Brooklyn, N. Y. Previous to this time, in the year 1857, he had, for the purpose of collecting material for an enlargement of his "Class-Book," made an exploration of the Southern States, lasting six months, and another shorter one in his own carriage. Having completed the third reprint of the "Class-Book," he again resumed the profession of instruction, opening in 1861 the Brooklyn Female Academy, which, in spite of the war, proved a great success. But the love of his favorite science again enticed him away; and, in 1865, after placing his affairs in Brooklyn in trusty hands, Prof. Wood, leaving his wife at Freehold,N. J., and his son at the New York University, set out alone for California. In this excursion he spent more than a year, traveling from San Diego to Puget's Sound, and returning by the way of the Isthmus in November, 1866. Much of this journey was done on horseback, and a part of it on foot and alone, and amid many hardships, dangers and privations. Prof. Wood loved to bear testimony in after years to the hospitality which was everywhere accorded him in this excursion. If night overtook him at the door of the trapper's hut, the miner's shanty, the stockade of the herdsman's ranche, or the Governor's mansion, the same kind greeting met him in each case. Among the rough trappers and miners he not unfrequently found educated, cultured men, who rendered him no little assistance in his pursuits.

Arriving at his home in Brooklyn, in 1867, he disposed of his interests there and collected his family into a new home in the village of West Farms, which was then a suburb but is now a portion of the City of New York. The last years of Prof. Wood's life were mainly employed in revising and republishing his several text-books on botany, which include the following works: "Class-Book of Botany," (1845); "Object Lessons in Botany" (1862); "Botanist and Florist" (1870); "Plant Record" (1872); "Fourteen Weeks in Botany" (1879, written jointly with Prof. J. D. Steele); and "Flora Atlantica" (1879). In addition to these educational works, Prof. Wood wrote a "Monograph of the Liliaceae," which was communicated to the Philadelphia Academy of Natural Sciences, and published in its *Proceedings* of June, 1868. At the time of his death he occupied the Chair of Botany in the New York College of Pharmacy, a position which he had filled for two years.*

§ 49. **The Preparation of Fleshy Pileate Fungi for the Herbarium.‡**—To the preparations previously described, still others may be added. If it be desired to exhibit, in a lamellate species, a view of the under surface of the pileus with the gills, the fleshy portion of the upper surface of one of the halves must be shaved off close to the gills, and the preparation laid, gills upward, on moist gelatine-paper, and submitted to pressure as before described. This proceeding is not well adapted for all lamellate fungi, but succeeds best with those species which, like *Cantharellus*, have decurrent gills; for these it is of great value. To prepare such fungi as these, a vertical section is made and from one or both of the halves the flesh is so nearly all removed that but just sufficient is left to support the gills. Then the flesh is removed from the interior of the stipe, and the fungus is ready for the gelatine-paper and press. The very small lamellate fungi, whose fleshy substance is very thin, may be simply dried between bibulous paper, under pressure, without any preparation, and afterwards be kept in paper envelopes. Of most of these species, however, there can be made very good vertical sections, which, after being dried on gelatine-paper, may be placed in the envelope with the other specimen. The species of the genus *Marasmius* are composed of a tough substance, which, after being dried, becomes soft again when placed in water. The larger fungi of this genus likewise may, therefore, be dried without preparation, since the specimens thus treated, on being moistened with water, assume again their original form, just as mosses and lichens do under the same circumstances. It is, nevertheless, recommended that a few specimens of each species of this genus be also prepared by the method under consideration.

We now come to the details of the method, which hitherto has been described only in a general way.

In most of the *Agaricini* there are found between the lamellae which radiate from the stipe to the circumference of the cap a few shorter ones, which start from the edge of the pileus but do not reach the stipe; and these are of various lengths. Often, too, the lamellae

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*Abstract of a "Biographical Sketch of Prof. Wood," read by Dr. O. R. Willis before the Torrey Botanical Club, March 8th.

‡Continued from page 34.

(especially in species of *Russula*) branch one or more times before reaching the edge of the pileus. When, therefore, a longitudinal section of one of these fungi is made, care should be taken to have only the full-length gills appear; and if, in the first section, one or two short gills stand in front of them, these should be cut away until the longer ones are reached. After making the section, which should be as thin as possible, it is fastened to the gelatine-paper with the long gills upward. It should be remarked that the thinner the section is made the easier it dries and the better the preparation keeps. Sections of species of *Boletus* are easily made because the cutting is done in the direction of the tubes. The same is the case with species of *Hydnum*.

Whenever it is possible, section-specimens of each species should be prepared to show the plant in its various stages of development. As soon as the fungus has arisen from its mycelium and just shows the arrangement of stipe, pileus, lamellae, or pores, or spines, as the case may be, a section of it should be made at this stage. This will show whether the species when young is enveloped in a universal veil, which, subsequently rupturing, remains as a volva at the base, a ring on the stipe and as floccose patches on the pileus (as in *Agaricus muscarius, A. rubescens*, etc.), or whether the margin of the pileus is involute (as in *Collybia*) or straight (as in *Mycena*), etc. When the stipe has still further developed, and the ring (when present) has separated from the pileus, another section should be made; and the same should be done with species provided with a veil, at the stage when the latter still connects the edge of the pileus with the stipe. With fungi having a ring of a delicate texture (*Amanita*, for example), great care and considerable skill are requisite in making the section, to avoid tearing the ring while cutting through it lengthwise. If the ring is movable (as in *Agaricus procerus*) it may be cut through at some one point and removed, to be afterwards placed on the preparation which gives a profile view of the fungus. The same care should be exercised in dividing those species which, like *Agaricus muscarius*, *A. phalloides*, *A. Mappa* and *A. vaginatus*, are provided with a volva at the base, in order that the section may show to what extent the bulbous portion and its margin are adherent to the stipe.

If it is a peculiarity of any species to vary greatly in size and shape, sections should be made of each of the different forms. When, as frequently happens in such species as *Hydnum imbricatum*, several fungi grow so closely together that their stipes and caps coalesce, sections should also be taken through two or more of the individuals thus joined together. Sections and other preparations of the genus *Coprinus* can be made from young specimens only, because of the peculiarity that these fungi have of dissolving at maturity into an inky fluid.

It will be found that the adherence of the sections to the gelatine-paper varies greatly according to the nature of the fleshy substance of the plant. Such fungi as *Boletus*, *Amanita* and *Hygrophorus*, whose flesh is of a soft, moist nature, adhere very quickly and readily. If the stipe of a species be of a cartilaginous, dry nature and the pileus be of a soft one, the pileus portion of the section will adhere very firmly to the gelatine-paper, while the stipe after drying may become easily detached therefrom. Sections, as well as other preparations, of the genera *Russula* and *Lactarius* do not adhere well; the fleshy substance of the former is firm, compact, or even floccose, and that of the latter contains a milky liquid. Such preparations may be made to stick better by moistening them with water before laying them on the gelatine-paper. Frequently also the lamellae do not adhere to the paper, probably owing to the copious detached spores. The portion of a preparation which does not adhere properly may be fastened down effectually with a solution of one part of gelatine in thirty parts of boiling water; the solution, after it is somewhat cool, being applied between the specimen and paper by means of a camel's hair pencil, and the specimen being pressed down on the paper and allowed to dry. It sometimes happens in preparations of fungi which have a viscid pileus, that, in the first pressing, portions of the pileus adhere to the overlying drying-paper. In such cases the specimen may be readily detached, without injury to it, by dampening the dryer slightly with a wet sponge.

After the preparations are dry they are to be cut out of the gelatine-paper with a pair of scissors, the paper being trimmed away as closely as possible to the specimen, so that the latter shall exhibit itself with sharp contours when finally gummed to card-board.

§ 50. **Mertensia Virginica,** DC., **in New Jersey.**—On the 6th of May, 1880, I brought home some specimens of this elegant plant which I had obtained near the extreme western edge of Monmouth County, N. J. I found my friend Mr. R. Willis Brown on a visit at my house, showed him the plants and proposed that he should stay all night and go with me next day to the locality, which was nearly twenty miles away. The season was too much advanced, as that May was unusually hot and dry, for we found the plants not in the finest condition. Desirous of working the subject up, so as not to be found pushing into the BULLETIN a notice of a mere fugitive or recent escape, I desired my friend to say nothing about it for the present. I have worked a good deal on the case and now feel confident that my find is worthy a place in the indigenous flora of our State, for these reasons: 1. I cannot find among the people, old or young, of these parts, any recollection of it as a garden-plant. The question has elicited a reply indicative of surprise: "Grow in gardens! Why it is a wild-flower!" 2. It has been known as a wild-flower for a number of years—how many I cannot say. 3. I have now found three localities where it grows, each several miles from the other. 4. The plants have enormous tap-roots, showing them to be well established. In truth, it is not easy to get a plant up with a moderate share of its root, so deep into the earth does the latter extend.

Should any one desire to visit a habitat for collecting, the one easiest found is on the Crosswick Creek, close to the north side of the bridge at Walnford. May I not be pardoned a pleasurable pride in adding this exquisite Virginia cowslip to the flora of New Jersey.

Freehold, N. J., April 2, 1881. SAMUEL LOCKWOOD.

§ 51. **Grasses New to California.**—In examining, in the herbarium of Isaac C. Martindale, some grasses collected in Plumas County, California, by Mrs. R. M. Austin, I found the following species which are not, to my knowledge, anywhere recorded as occurring within the State: *Hierochloa borealis*, R. & S.—a robust form, but very distinct from *H. macrophylla*, Thurb.; *Spartina gracilis*, Trin.; and *Briza minor*, L. The latter species has also been found on ships' ballast below Philadelphia, by Mr. Isaac Burk. I am not aware that this plant has before been mentioned as occurring in this country.

Girard College, Philadelphia. F. LAMSON SCRIBNER.

§ 52. **Ranunculus Cymbalaria,** Pursh.—I have collected a pubescent form of this species of *Ranunculus*,at Belen, on the Rio Grande, and at McCarty's Ranche, on the Rio San Jose, both in New Mexico.

Silver City, N. M. H. H. RUSBY.

§ 53. **The Grasses of North America.**—I propose to publish sets of the grasses of North America in fascicles of about one hundred species each, as fast as material can be gathered for the purpose.

It is intended that these sets shall be *authentic*, and no pains will be spared to make them so. The labels will be neatly printed, and will contain the accepted name of the plant, the more important synonyms, references to published descriptions, the geographical distribution of the species and the habitat of the specimen. When twenty-five or more good specimens of a species are received from any one collector his name will appear on the ticket.

In order to carry out my proposed work, I shall be obliged to depend largely upon the generosity of collectors and botanists interested in the progress of science, for specimens of species not found in this immediate vicinity. Those donating specimens will receive sets, more or less complete, according to the quantity and value of their contributions. Sets will also be sent to the more important herbaria of this and other countries, and a limited number will be offered for sale to subscribers.

I hope to have the first fascicle ready for distribution early next winter, and the others will follow as fast as they can be made up.

I shall be pleased to communicate with botanists interested in the success of the work here proposed, and wishing to aid in its prosecution; also with those who may have grasses which they would like to have named.

Girard College, Philadelphia, Pa. F. LAMSON SCRIBNER.

§ 54. **Botanical Literature.**—Trimen's *Journal of Botany* for March contains articles on '*Potamogeton lanceolatus* of Smith,' by A. Bennett; 'Some Recent Tendencies in Botanical Nomenclature,' by B. D. Jackson; 'Some Mosses collected in Ireland,' by D. Orr; 'On Darwin's Doctrine of Cleistogamy,' by S. LeM. Moore; and on '*Erythraea capitata*,' by F. Townsend.

In the *Botanical Gazette* for April Prof. Rothrock describes certain modes of work in DeBary's laboratory; Mr. Rusby contributes notes on the fern-flora of New Mexico; Mr. Greene calls attention to the mistakes in books as to the colors of some Western flowers; and Miss Banning has some notes on Maryland fungi.

§ 55. **The Syracuse Botanical Club.**—The Annual Meeting was held on the 23rd of March, and we proceeded to elect officers for the ensuing year. Much to the regret of the Club, Mrs. Gifford, Vice-President, and Mrs. Myers, Secretary, resigned their offices. At our next meeting the work of each member will be laid out for the coming year. The officers elected for 1881 are: President, Mrs. S. M. RUST; Vice-President, Mrs. M. C. STILL; Corresponding Secretary, Mrs. KATE BARNES; Recording Secretary, Mrs. H. ROWLING; Treasurer, Mrs. A. D. FAIRBANKS.

Syracuse, March 29th. KATE BARNES, Corresp. Secretary.

§ 56. **Proceedings of the Torrey Club.**—The regular meeting of the Club was held at the Herbarium, Columbia College, Tuesday evening, April 12th, the President in the chair, and sixteen members and two visitors present.

Teratology.—Mr. Gerard exhibited a specimen of *Fuchsia* leaves which were coherent by their margins and petioles, sent by Mr. James Cook, of Canada, for the Club's inspection; also, from another source, a specimen showing adhesion of two flowers of *Fuchsia.*

Mr. Hollick read some notes on variations which had been observed by him in flowers, fruits and leaves. In addition to some abnormal forms which have already been referred to in the BULLETIN, he noted the following: *Thalictrum anemonoides*, Michx., variety in which all the sepals were green; staminody in *Narcissus poeticus*, a garden scape in which most of the petals were rolled up and tipped with an imperfect anther; *Carya porcina*, Nutt., exhibiting a peculiar distortion of the fruit (specimens shown), occurring year after year near Court House Station on the Staten Island Railroad; *Castanea vesca*, var. *Americana*, with nuts much larger than usual and covered with a dense tomentum; and *Lysimachia quadrifolia*, L., with 3, 5 and 6 leaves in a whorl, and also with leaves alternate.

Mr. Bicknell read some notes (illustrating them with specimens) on some variations in ferns. Of the specimens shown and described, there were some of *Botrychium matricariaefolium*, A. Br., in which both the sterile and fertile segments were variously distorted. Sporangia, both scattered and clustered, were borne on various portions of the sterile segments, while the fertile segments, besides showing a tendency to become foliaceous, were very singularly branched —in one instance showing a well-marked apical division. Another specimen shown was a frond of *Phegopteris hexagonoptera*, Fée, in which the two basal pinnae were very greatly developed, giving the whole plant somewhat the habit of *P. Dryopteris.* Still another specimen was one of *Aspidium spinulosum*, Swz., which, by the peculiar growth of the axis, had been brought into such a position as to cause the frond to resemble a five-pointed star.

Messrs. Brown, Hollick and Schrenk were appointed a committee on field excursions for the coming season.

Two corresponding and five active members were elected.

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a
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5

C. E. Faxon del. A. Meisel lith.

CHEILANTHES PARISHII, n. sp.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VIII.] New York, June, 1881. **[No. 6.**

§ 57. A New American Fern.

By Geo. E. Davenport.

(Plate viii.)

Cheilanthes Parishii, *n. sp.*—Rootstock creeping, short, clothed with deep-brown linear-lanceolate scales, with darker, nearly black mid-nerves; fronds stalked, 5′ to 7′ tall; stipes approximate, 2′ to 3′ l., varying from light to dark-brown, clothed at the base with scales similar to those on the rootstock, passing gradually into broader pale-brown, or nearly white nerveless scales, above with more or less deciduous, slender pale scales and chaff; laminae 3′ to 4′ l., 1′ to 1¼′ b., oblong-lanceolate, 3–4-pinnate, both surfaces scantily clothed with a coarse, entangled, woolly pubescence composed of long, jointed, colorless hairs; rachises beneath covered with narrow, jagged or toothed pale-brown, or nearly colorless reticulated scales, intermixed with hairs; pinnae alternate, unequally ovate, or oblong-ovate, obtuse, lowermost somewhat distant; pinnules oblong-ovate, obtuse, pinnately divided into deeply pinnatifid, or, in the lowermost pinnae, pinnate divisions; segments roundish, ultimate segments largest and 3-lobed; involucres very narrow, only partially enclosing the sori, and formed of the slightly recurved, unchanged herbaceous margins of the segments; sori scanty (in the specimens), consisting of a few light-colored sporangia at the ends of the forked veins.

Habitat.—Crevices of rocks, desert hill, San Diego County, east of San Bernardino, California, with *Notholaena Parryi.* Discovered by Mr. W. F. Parish, of the well-known firm of Parish Bros., San Bernardino, March, 1881.

Nothing definite is known of its abundance, but Mr. S. B. Parish, who sends it, writes me that it is probably scarce, as his brother, who discovered it, could find only a few plants (about three) in the neighborhood, after a careful search.

From the *Myriophylla-Fendleri* group it may be readily distinguished by the character of the distinct woolly tomentum; and, moreover, the slenderer scales on the under surface are not imbricated as in that group, and are wholly confined to the rachises. It very much resembles *C. lanuginosa* in the grayish woolly appearance of the face, the shape of the segments, and the narrow involucres; but differs from that species in the character of the rootstock and the *scaly rachises beneath.*

My thanks are due to Mr. Faxon for the pains he has taken with the drawing, and more especially for the microscopical analysis, which I was unable to make myself on account of the present condition of my eyes.

Explanation of the Plate.—Fig. 1. Plant, natural size. Fig. 2. Lower pinna. Fig. 3. Enlarged pinnule—ordinary form. Fig. 4. Magnified segment, showing veins and sori. Fig. 5. Sporangium.

Fig, 6. Spore. Fig. 7. *a*, scale from rootstock; *b*, scale from lower part of stipe; *c*, scale from rachis. Fig. 8. Magnified tomentum, showing jointed hairs.

Medford, Mass., May, 1881.

§ 58. On a Recent Determination of Lepidodendron.

By Herman L. Fairchild.

The Annual Report of the State Geologist of New Jersey for 1879 contains an announcement by Prof. L. Lesquereux to the effect that *Lepidodendron* has been found in the Triassic rocks of that State. Such a discovery would be of the greatest importance to Palaeontology; and, being so opposed to all experience and expectation, would excite unusual interest. The passage from Prof. Lesquereux's letter to Prof. Cook, as it appears in the Report, page 26, reads as follows:

"The photographs are sufficient, if not for specific determination at least for positive reference of the specimens to *Lepidodendron.* Even I should say that the specimens represent *L. Weltheimianum*, Prest., as distinctly as a specific representation can be be made upon a decorticated trunk of *Lepidodendron. L. Weltheimianum* is a leading species of the old red sandstone, found here, as in Europe, from the Sub-Carboniferous measures down to the Devonian, while until now we do not have any remains of *Lepidodendron* of any kind from the upper coal-measures (Permo-Carboniferous), or from higher up than the Pittsburg coal.

L. Weltheimianum is recorded only once from the true coal-measures; this by Eichwald, from the carboniferous sandstone of Russia. But European authors, among others Goeppert, doubt the identity of the Russian species with *L. Weltheimianum*, which is, moreover, extremely variable, and has been described already under about thirty different names."

I have had the opportunity of examining a series of photographs, duplicates of those sent Prof. Lesquereux, and with all proper deference to his authority, I should nevertheless say that his determination rests upon a very insufficient basis of facts.

The photographs show surfaces prominently marked with swelling areas separated by deeply furrowed lines. These areas are quite irregular in both size and shape. Some of them are regularly rhomboidal; but from this they vary to sub-linear. A quincunx arrangement is of course unavoidable with this shape. The surfaces shown probably represent the wood. But whether wood or cortex they certainly are entirely without the peculiar vascular markings which belong to the leaf-scars of *Lepidodendron*; and, indeed, they are destitute of any other definite characters.

In the first place, as regards the generic identification, it should be noted that, in the paragraph above quoted, Prof. Lesquereux admits the well known fact that *Lepidodendron* has never been found above the middle coal-measures. Now one might not wisely assert the impossibility of finding the genus in the Permian or even in the Trias. But many facts unite to render it extremely improbable. These facts are so familiar to many that it will be sufficient for the present purpose simply to mention a few of the most important.

We may note the almost universal extermination of genera at the close of the Carboniferous, marking the grand division between Palaeozoic and Mesozoic times. The types of the Mesozoic are more highly organized forms than those of the Carboniferous. The great physical and climatic changes which influenced the organic changes; and the immense lapse of time of which no record is found. To these more general facts, now add the striking and very important one that no *Lepidodendron* has ever been found in the upper coal-measures, where other vegetation of similar habits is abundantly preserved. Another point is, that *Sigillaria*, a plant of higher structure and affinities than *Lepidodendron*, and which continued to the end of the Carboniferous, has never afforded a specimen of later age. Moreover, the life of the Trias is comparatively well known, and plants in considerable abundance have been found in many Triassic areas in different parts of the world.

Although the objections to Triassic *Lepidodendron* are so evident and forcible, we nevertheless must admit that the improbability does not decide the question. But the evidence as to the nature of the fossils should be in the highest degree clear and incontrovertible to justify such a reference as the one under consideration, in opposition to all experience and probability.

Upon what facts or reasons, then, is this determination really based? Merely that the surface of the fossils is covered with irregular rhomboidal areas. These have of necessity a spiral arrangement, and, in this respect, but in this alone, resemble imperfectly preserved *Lepidodendron*. *They possess none of the characteristic interareal markings, the sure test of that genus.* If the fossil were found in the coal-measures one would be justified in supposing it to be a decorticated *Lepidodendron*. But some cycads have similar markings, and so have many conifers, as *Araucaria*. And why not Mesozoic conifers or cycads, the characteristic plants of that era? Or, as yet more probable than *Lepidodendron*, why not some unknown group of plants related to, or superficially resembling *Lepidodendron*?

That the fossils in question belong to some one of these groups is vastly more probable. And the reasons for the determination are certainly insufficient to sweep away all the weight of objection and bridge the great gap between the life of the Palaeozoic and Mesozoic.

Secondly, the specific determination is even less well founded. *L. Veltheimianum** is admitted to be characteristic of the Devonian and Sub-Carboniferous the world over, with not a single undoubted specimen from the coal-measures. Yet in the coal-measures it ought surely to be found if it had then existed. Not to find it in those deposits, filled with similar plants, which cover so wide and scattered areas, and represent such a duration of time, is to be almost certain of its extinction. The same reasoning applies to this which applies to the absence of all *Lepidodendron* from the upper coal-measures.

No one would claim that all Carboniferous species have been discovered. But that an arborescent lycopod could have a world-wide distribution in the Sub-Carboniferous and there exist, up through all the coal-measures, under the most favorable conditions possible for preservation, without discovery is very improbable. There is no example of a plant existing through such a lapse of time and such geologic changes as intervene between the Devonian and the Trias. Even if the fossils were *Lepidodendron* at all, to identify them with the most ancient species would certainly seem erroneous.

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*The old authorities credit the species to Sternberg and not to Presl, (I judge the spelling of the author's name in the quotation is a typographical error) and spell the specific name with V as initial.

It may be said that Prof. Lesquereux does not call the fossil *L. Veltheimianum* positively, only "as distinctly as a specific representation can be made upon a decorticated trunk." That is, however, pretty decided, for decorticated specimens have been his basis for new species. It would seem to have been better to regard these fossils, if *Lepidodendron* at all, as a new species, if for no other reason than their separation in time from the Lower Carboniferous species.

I should have been pleased to examine the fossils themselves; but I have seen other fossils from the same region which are so similar in appearance as to leave little doubt of their identity in kind, and they are not *Lepidodendron*. And we may confidently believe that the genus has not been discovered in rocks later than the Carboniferous.

NOTE: The above article was written a year ago, but its publication has been delayed in the hope of seeing the specimens, and so placing the matter beyond doubt. Recently, I have examined some fossils from the same locality and of precisely the same character as those in question; and my suggestion that the furrowed surface shown in the photographs probably represented the wood, is fully confirmed. Considerable of the bark is in position, and carbonized, but the exterior surface shows not the slightest trace of quincunx markings. The photographs represent the same condition, but before seeing these specimens I could not assert that the smooth external layer was carbonized cortex. This fact alone is sufficient to establish beyond question its distinctness from *Lepidodendron*.

§ 59. **New Species of North American Fungi.**

By J. B. ELLIS.

MARASMIUS PYRINUS.—Minute, about 1-4th of an inch high; pileus membranaceous, hemispheric, sometimes slightly umbilicate, sulcato-striate, pale at first, becoming chestnut-brown, .04′—.045′ diameter; stipe filiform, striate, brown, paler above; spores obovate, .00015′ long. The outer coat of the pileus consists of a layer of ovate, echinulate, spore-like bodies, something like the spores of a *Scleroderma*.

On decaying pear-leaves lying on the ground. June, 1880. (Ellis, *N. Am. Fungi*, No. 401).

CORTICIUM ECHINOSPORUM.—Effused, indeterminate, hymenium sulphur-yellow, forming a thin, soft, sub-membranaceous stratum on the loosely-compacted threads of the subiculum, which form a scanty, evanescent, light-colored margin; basidia clavate, spicules rather long. bearing at their tips the globose, echinulate spores, which are in diameter .00015′—.0002′.

On wood and bark of pine, November.

ARTHROSPORIUM COMPOSITUM.—White, tufted or subconfluent; stems about 1-16th of an inch high, composed of compacted threads, whose free ends form lateral branches which bear fusiform, 3-septate conidia, .0013′—.0015′x.0002′ in size.

On dead limbs of *Kalmia* buried under old leaves in swampy woods. Autumn. (Ellis, *N. Am. Fungi*, No. 415).

Sphaeronema sphaeroideum.—At first covered by the epidermis, through which the coarse, brown hairs that clothe the perithecia are clearly visible; soon erumpent, bald and rough, nearly as large as a small turnip-seed; ostiolum subconic, soon collapsing; stylospores clavato-fusiform, slightly curved and faintly 3-septate, obtuse above and narrowed below into a slender stipe, together with which it is about .0015′ long.

On dead herbaceous stems, Pleasant Valley, Utah. S. J. Harkness.

Graphium laxum.—Gregarious, gray; stems short and thick, the threads spreading above and bearing fusiform-cylindric, 2-septate conidia, .002′ long.

Makes a near approach to *Cercospora*. On living bean-leaves. West Chester, Pa., September, 1880. W. T. Harris. (Ellis, *N. Am. Fungi*, No. 546).

Cercospora Ilicis.—Seated on brown spots, which are limited by a narrow, raised border; amphigenous, tufted; hyphae septate, subnodulose, .002′—.0025′ high; bearing at their tips clavato-cylindric, hyaline, nucleate, and at length 1–3-septate conidia, which are .001′—.002′ long.

On living leaves of *Ilex glabra*, July.

Cercospora acetosella.—Forming leaden-gray patches on the dead and withered leaves; scattered thickly in minute tufts; the erect hyphae short and sparingly septate, bearing at their tips linear-clavate, nucleate conidia, .002′—.0025′ long.

On *Rumex Acetosella*, September.

Propolis glauca.—Outward appearance the same as that of *P. versicolor*, Fr., but the disk always glauco-cinereous; asci broad-cylindric, sessile, .00033′x.0007′; paraphyses abundant, crisped and branched at their tips; sporidia uniseriate, oblique, broadly elliptical, hyaline, binucleate, constricted in the middle and about .0007′x .0005′.

On bark of dry, dead twigs of *Quercus coccinea*, August. (Ellis in Rehm's *Ascomycetes*, No. 465).

Stictis pustulata.—Pustuliform, black, closed at first but soon perforated in the centre by a white, pruinose mouth, which is nearly closed by the incurved, subfimbriate margin; asci cylindric, narrow, .0035′ long; sporidia filiform, as long as the asci. Hymenium dark and shining when dry.

On old stems of *Trifolium pratense* lying on the ground, April.

Ailographum culmigenum.—Very minute, scarcely visible to the naked eye, and lying in different directions on the matrix, linear, straight or bent; asci ovato-globose, with a short stipe, about .0005′x .0003′, filled with hyaline sporidia, which *appear* to be ovato-pyriform and about .0002′x.000075′.

On basal sheaths of old *Andropogon*. January.

Peziza (Sarcoscyphae) Hainesii.—Sessile, urceolate, 1′—1′.5 diameter, creamy-white within, covered with a rufous-brown, piloso-tomentose coat, which is more distinct in the young plant, veined or subplicate and lacunose at the base, mouth at first closed by the marginal fringe of brown, septate, minutely-rough hairs; asci long, cylindric; paraphyses simple, septate below, stout, not thickened above; sporidia uniseriate, rather acutely elliptical, filled with coarse granular matter and nuclei, .001′x.0005′.

Inside of an old stump, West Chester, Pa. W. T. Haines, August, 1879. (Ellis, *N. Am. Fungi*, No. 562.)

PEZIZA (DASYSCYPHAE) MINIOPSIS.—Gregarious, sessile minute, .02′—.03′ across, clothed with a white tomentose coat of crisped hairs; disk scarlet and cup-shaped; asci clavato-cylindric, .0038′x .0005′; sporidia crowded, linear-lanceolate, .002′—.0025′ long, yellowish, nucleate and finally multiseptate; paraphyses filiform, not thickened above. The disk is orange when fresh and scarlet when dry.

On outer bark of living *Acer rubrum*. June. (Ellis, *N. Am. Fungi*, No. 563).

§ 60. **Lichens or Fungi?**—I wish to ask the attention of botanists interested, to a forthcoming work of great research on the limits of the two classes named above. Dr. Arthur Minks of Stettin, Prussia, has already, by his "Contributions to the Knowledge of the Structure and Life of Lichens" (*Beiträge*, etc., pp. 126, and 2 plates, 1876), and especially by his larger work on "The Microgonidium" (pp. 250, and six plates, 1879), conciliated the thorough respect of all unprejudiced lovers of science. He has now begun another undertaking which appeals to mycologists even more than to lichenists. The evident approaches between the vast realm of the Fungi and the smaller, but higher and more readily comprehended domain of the Lichens, have been explained in such a way that, while a great deal remained evidently unsettled, the lichenologist gained the advantage of understanding after some fashion his position, while the mycologist (I venture here to speak from my own correspondence) found himself often in doubt, and without, it seemed, any sufficient criterion of judgment. It is surely interesting then, that, taking his departure from the essential distinction (as he undertakes to demonstrate it to be) between the *theca* of Lichens and the *ascus* of Fungi, Dr. Minks finds himself now in position to declare that the boundary line separating the Lichen-world from that of the Fungi runs far within the present limits of the latter; and that we are henceforth to look not (with Sachs, *Lehrbuch*, edit. 3, p. 266) towards an ill-assorted union of Lichens with the Ascomycetes, but quite the other way. Many thousands of species of so-called Fungi are thus to be elevated, or relegated to the other class; and a most important step in this way taken towards the removal of manifest, and not by every one approachable, difficulties of the System of Plants.

Dr. Minks proposes to give sufficient anatomical-morphological sketches of every species examined by him, not excluding the discussion of gene ical and species-values, much in the manner of his "Morphologisch-Lichenographische Studien," in *Flora*, 1880, n. 33, 34. He will also fully consider such plants as, while appearing to belong to the number of those which are well-associable in some or other respects with Lichens, yet remain without doubt Fungi; and seek, in a word, to draw the new line of separation of the two divisions as sharply as possible.

The title of the new work is "Symbolae licheno-mycologicae. Beiträge zur Kenntniss der Grenzen zwischen Flechten und Pilzen." Cassel; Theodor Fischer. The first number will be published in June; and future ones, each to embrace about two hundred species, will follow annually. As there are no plates, the price will be moderate. Orders may be addressed to the publisher, or otherwise.

EDW. TUCKERMAN.

§ 61. **Unusual Habitat of a Coprinus.**—In October, 1880, I received from Framingham, Mass., a quantity of water which contained a large amount of *Coelosphaerium Kützingianum*. The water was placed in a clean glass jar and covered with a pane of glass. I had intended to watch the phenomena attending the purifying of the water, which is generally accomplished in about a fortnight, the slimy bluish-green masses of the algae gradually dissolving and forming a slight deposit at the bottom of the jar, leaving the water clear above. Contrary to my usual experience, the greenish masses did not disappear, and the contents of the jar remained scarcely changed until early in December. At that date, I noticed spots of mould in several places on the top of the rather thick fluid, and, on examination the hyphae were seen to proceed from small black sclerotia sunk just below the surface. The hyphae, in the course of a few days, developed into small *Coprini* scarcely more than a quarter of an inch high. On Dec. 13th, being about to close my laboratory for some time, I was obliged to throw away the contents of the jar before the *Coprini* had matured, and it was impossible to say with certainty what the species was, although it apparently was a small form of what is figured by Brefeld in *Botanische Untersuchungen über Schimmelpilze*, Part 3, as *Coprinus stercorarius*. Although it is possible to raise *Coprini* on slides in a decoction of horse dung, their spontaneous occurrence in water containing algae is unusual, and the appearance of the small *Coprini* as they rose from the surface of the water, which was between five and six inches deep, was very singular. The sclerotia of the *Coprinus* were certainly not in the water when first placed in the jar, as they would easily have been seen in the frequent microscopical examinations of the water made in October; but the fungi were probably produced from spores remaining from a culture of *Coprinus* made in the laboratory about six months before the water was received from Framingham. The jar had previously contained a quantity of growing *Nitella* and was carefully cleaned before the Framingham water was poured into it.

W. G. FARLOW.

§ 62. **Note on Laminariae.**—In the BULLETIN for November, 1880, there is a note by Mr. F. S. Collins on a *Laminaria* found on the coast of Maine, and referred by him to *L. longipes*, Bory. In his "Examen des espèces confondues sous le nom de *Laminaria digitata*," Le Jolis states that an examination of the Bory herbarium showed that the *L. longipes* of Bory was only a form of *L. saccharina*, Lin. Through the kindness of Mr. Collins I have been able to examine specimens of the alga from the Maine coast, and it seems to me that they belong to *L. saccharina*, in spite of the narrowness of the frond and the long stipe. The forms included under *L. saccharina* by American algologists do not with certainty all belong to that species, and it is possible that the broader northern forms belong rather to *L. maxima* (Gunner). But sufficient material has not yet been obtained at different seasons of the year to make the diagnosis certain. In this connection I may mention the Californian specimens at first distributed privately as *L. Andersonii*, but later recognized as the *Lessonia Sinclairii* of Harvey. This is apparently the *Laminaria Ruprechtiana* of Le Jolis (*l. c.*),of which he considers *Lam. saccharina*, var. *angustifolia*, Post and Rupr., Illust. Alg., Tab. XI, *Lam. longipes*, J. Ag. Spec. Alg., and *Lessonia repens*, Rupr., Alg. Ochot., to be synonyms. Since it was ascertained that the species called *L. Andersonii* was the same as *Lessonia Sinclairii* the manuscript name of *L. Andersonii* has been applied by Prof. Eaton and myself to a second species from the California coast which belongs to the digitate division of the genus and not to the section *Saccharinae.*

Cambridge, Mass. W. G. FARLOW.

§ 63. **Note on the Perforation of Flowers.**—In the vicinity of Ithaca, N. Y., the flowers of *Dicentra Canadensis* are all perforated, year after year, as described by a correspondent of the BULLETIN* some years ago. Last spring, after a tiresome watch, I succeeded in capturing the malefactor, which, in this case, proved to be one of our very common humble-bees (*Bombus Virginicus*, Oliv.†). The holes were cut in the manner described by the writer above referred to, the bee beginning at or near the bottom of the flower-cluster, and ascending when visiting the flowers normally. Flowers of the common blue violet, *Viola cucullata*, were not infrequently found with reniform holes cut in their spurs, but the author of the mischief was not detected.

The general impression seems to be that short-tongued humble-bees are responsible for most of the perforations like these, though the hive-bee has been shown to perforate flowers in a few instances, and it certainly is not above frequently using those made by its larger relatives.§

So far as I know, other insects have never been charged with perforating flowers for their nectar, and Mr. Darwin says that "no insects except bees, with the single exception of wasps in the case of *Tritoma*, have sense enough, as far as I have observed, to profit by the holes already made."‡ Last year, while studying the flowers of *Ribes Cynosbati*, I noticed on one plant many which were perforated near the base with round holes about 1.5 mm. in diameter. After a while I succeeded in detecting a white-faced hornet (*Vespa maculata*, L.) in the act of cutting these holes with its mandibles, and thus obtaining the nectar surreptitiously. On three occasions, however, this insect was seen to visit the flowers normally, and it must be perfectly able to obtain the nectar from their mouth. The flowers of *Symphoricarpus racemosus* were also frequently found with similar perforations. This, as is well known, is a species largely fertilized by wasps; but, though I watched carefully, I could not catch any insect making or using the holes; and, in ascribing this also to the hornet, I am simply stating what appears most probable to me.

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*Vol. iii, p. 34. †Kindly identified by Mr. E. T. Cresson.

‡'Cross and Self-Fertilization' (Amer. ed.), p. 427.

§ For other bees see Delpino: Ult. Oss. II. 2, 114. Comes: Impollinazione. 24. & my references.

For Xylocopa see Psyche, 1882, p. 298 & p. 343.

Ants, too, are sometimes guilty of a similar misdemeanor. The species known as *Formica fusca* has been repeatedly seen to gnaw through the fleshy calyx of *Ribes Cynosbati*, at about the point where the flowers are perforated by the hornet. The openings made by the ant, however, are larger and more irregular than those described above, and not infrequently the insect, attracted by the sugar with which this part of the calyx is gorged, eats away large parts of the flower. A case of perforation of the corolla, solely for access to the nectar contained within, came to my notice in Brooklyn, N. Y., in Sept., 1880. The fine pubescence of the corolla of *Salvia splendens* appears to be quite efficient in preventing creeping insects from reaching the mouth of the flower. A small ant, the name of which I have not been able to obtain, finding itself almost unable to enter in any other way, and wanting the nectar, gnawed rather large, irregular holes through the corolla just at the end of the calyx,* through which it entered and feasted upon the sweets within. Large numbers of the flowers were perforated, and the ants were repeatedly seen to make and use these openings.

In addition to these, there is one other class of animals which occasionally rob flowers of their nectar through perforations which they make for that purpose, namely, birds, according to Darwin.† Prof. Beal has found the golden currant (*Ribes aureum*) perforated by orioles, and readers of *Nature* and *Science Gossip* will recall numerous notes on the piercing and tearing of flowers by sparrows. There are, however, cases in which birds that are adapted to fertilize flowers covet the sweets of some whose nectar they obtain more easily by perforating them than by working in the proper way. My friend, Prof. W. A. Henry, tells me that he has seen in Ohio numbers of flowers of the trumpet creeper (*Tecoma radicans*) perforated through calyx and corolla by birds, as he believes, and I should not be surprised if the misdemeanor were to be fixed upon the ruby-throated humming-bird.§ Darwin‡ states that while long-beaked humming-birds visit the flowers of *Brugmansia* normally, some of the short-beaked species perforate them; and they frequently pierce the tubular flowers of *Tacsonia*.

From the facts stated, it appears that under some circumstances humble-bees, hive-bees, wasps, ants and birds perforate flowers in order to rob them of their nectar.#

WM. TRELEASE.

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*'American Naturalist,' Apr., 1881, p. 297, Fig. 1.

†'Cross and Self-Fertilization,' p. 432.

‡*l. c.*, p. 371, note.

§ Cf. Scrophularia, Torr. Bull. Nov. 1881.

[illegible]

[illegible] 1878. [illegible]

[illegible] 1877, 209.

[illegible]

§ 64. **Notes from Utah.**—*Oxytropis campestris*, var. *viscida*, Watson. I found this plant on the summit of the highest mountain in the Wasatch; it grows in large dense mats. The flowers are dark blue, never "white" in my specimens.

I have a number of interesting *Astragali*, several of which appear to be new, especially those from St. George.

Galium asperrimum, Gray. The fruit is beset with short, stout, aculeate hairs. One side of the fruit is often abortive. The plant is certainly perennial. The flowers are white.

Arabis longirostris, Watson, seems to be quite variable.

I found at Frisco a peculiar *Lepidium* which I sent out as *L. Utahense*, n. sp., but it is said by Mr. Watson to be the little known *L. integrifolium* of Nuttall, the description of which I have not seen.

The flowers of *Malvastrum exile*, Gray, in all the many specimens that I have, are almost pure white, not "purple."

Prunus fasciculata, Gray, passes the limits assigned to it by Gray to a considerable extent. The flowers vary from one to ten in a bunch, nearly equaling the leaves (in the short-leaved form), or four times shorter. The leaves vary from 3″ to 12″ long, from short spatulate to oblanceolate, with a long acuminate base and short petiole. Well-developed leaves are usually irregularly-serrate above the middle, sometimes tridentate, or rarely three-lobed. The petals are oblanceolate, not "linear," and are white.

Rubus leucodermis, Dougl., has a delicious fruit and is very prolific. It is a black raspberry.

The flowers of my specimens of *Gilia pungens*, var. *squarrosa*, are *yellow*, as stated by Douglas.

I have a *Gilia* which appears to be intermediate between *leptomeria* and *inconspicua*. The corolla is glandular and hairy on the outside, 6″ long, 3″ broad, purple, lobes obovate, acute; radical leaves once pinnatifid, with oblong, rounded or sinuate lobes, the few cauline leaves linear or sometimes pinnatifid. It resembles very closely *G. inconspicua*, is not densely branched, is rather few-flowered, with leaves almost all radical, is glandular throughout, and has seeds without spiricles.

GILIA SCOPULORUM, *n. sp.* I hesitate to describe as new, a plant near to the group to which *G. inconspicua* and *G. leptomeria* belong, but this plant seems so distinct that I venture to describe it. Corolla tube very slender, 5″–7″ long, ⅓″ wide; lobes and tube purple, throat yellow; lobes 1½″ long by 1″ wide, obovate, scarcely acute; calyx 1″ long, with teeth lanceolate or oblong, awn-tipped; capsule broadly ovate, equaling the calyx-teeth; seeds without spiricles (apparently); pedicels 2″–12″ long, slender; lower leaves oblanceolate or oblong, pinnatifid, with petioles 6″ to 12″ long, upper leaves broader and less pinnatifid, short-petioled; uppermost, as broad as long, and three-lobed, all awn-tipped; a span or two high; annual; leaves, stems and calyx viscidly hairy.

The upper leaves of *G. inconspicua* grow gradually smaller and narrower as they approach the inflorescence, while those of this plant follow the opposite mode of development. This plant grows in the shade of the lava rocks at St. George, and flowers in April. Mr.

Watson has called this and another widely different form *G. inconspicua*, var. *sinuata*, but on comparing the two forms I see no similarity except in the size of the flowers.

Salt Lake City, Utah. MARCUS E. JONES.

§ 65. **Rondeletia (Rogiera) cordata,** of the conservatories, has a strong tendency to increase the number of parts of the flower. While it may be regarded as normally pentamerous, I have found in the same cluster, and almost as a constant thing, flowers with six, seven, or even more lobes to the corolla, accompanied by a corresponding increase of stamens. In the much-compounded cymes, fasciation is frequent, as many as three flowers often being fused together. The interior of the tube, the base of which is filled with nectar, has an admirable arrangement for protecting this from small insects. It is clothed with interlacing and *upward*-pointing hairs. High powers of the microscope show these to be moniliform. It is hardly conceivable that an ant could pass them.

Brown University, April 21, 1881. W. W. BAILEY.

§ 66. **Plant-Stations Wanted.**—I would like to learn through the BULLETIN or otherwise, the extreme northern limits of the following plants: *Pinus Taeda*, L., *Juncus maritimus*, Lam., and *Zanthoxylum Carolinianum*, Lam. I would be pleased also to learn the southern limits of the following plants: *Xanthium strumarium*, L., *Draba verna*, L., *Trifolium procumbens*, L., *Cakile maritima*, Scop., and *Salicornia mucronata*, Lag.? All the foregoing plants grow in this county; the first two being especially abundant and probably extending far north of this place.

Messongo, Accomac Co., Va. ELLIS MEARS.

§ 67. **Botanical Literature.**—*The Gymnosporangia or Cedar-Apples of the United States.* By W. G. Farlow. (From the Anniversary Memoirs of the Boston Society of Natural History. 1880. 4to, pp. 38, with two plates). This interesting memoir is the outcome of some comparatively recent researches made by Prof. Farlow on the species, as represented in the United States, of *Gymnosporangium*, one of the genera of the *Pucciniaei*. The species of this genus of fungi, popularly known as "cedar apples," are comparatively few, and their development was first studied by Oersted, of Copenhagen, who traced a connection between them and the species belonging to the genus *Roestelia*. Oersted's observations having been subsequently confirmed by De Bary, Cornu, Cramer and others, the old genus *Roestelia* was suppressed, and what were formerly regarded as species are now usually referred to as the aecidial or hymeniferous stages of different *Gymnosporangia*. Oersted even went so far as to announce that he had succeeded in connecting genetically each of three species of *Gymnosporangium* with a particular species of *Roestelia*.

Prof. Farlow having determined to ascertain, if possible, whether our species of *Gymnosporangium* likewise could be genetically connected with our species of *Roestelia*, it became necessary, in order that any experimental cultures that might be made should prove satisfactory and of value, that the limits of the species of both genera should first be well defined. The greater part of his memoir, therefore, is devoted to an account of the morphological characters of the United States species of the two genera. As a result of his studies in this direction, the author recognizes the following species of *Gymnosporangium* (in which he includes *Podisoma*); *G. Ellisii* (Berk.), *G. clavariaeforme*, DC., *G. fuscum*, var. *globosum*, Farlow, *G. biseptatum*, Ellis, *G. clavipes*, C. & P., and *G. conicum*, DC. Of *Roestelia* he recognizes the follow species: *R. botryapites*, Schw., *R. transformans*, Ellis, *R. cancellata*, Rebent, *R. cornuta*, Fr., *R. lacerata*, Fr., *R. penicillata*, Fr., *R. hyalina*, Cke., and *R. aurantiaca*, Pk. It thus appears that we have eight species in each genus, or, throwing out *G. conicum* (as to the occurrence of which in this country the author is skeptical) and uniting, as is done by many botanists, *R. lacerata* and *R. penicillata*, we have seven species of each.

Having determined these facts, Dr. Farlow undertook, during the springs of 1876, 1877, 1878 and 1880 a series of cultures of *Gymnosporangium* spores on the leaves and young plants of such Pomeae as are usually attacked by *Roesteliae*; selecting for his experiments the species *G. macropus*, *G. fuscum*, var. *globosum*, *G. biseptatum* and *G. clavipes*. The results of these experiments are certainly not calculated to strengthen the faith of those who have relied on the accuracy of the Danish botanist's conclusions. The sowings were succeeded by spermogonia in a very small number of cases—on 10 leaves out of 126—and upon only two plants (*Amelanchier Canadensis* and *Crataegus tomentosa*) out of the seven chosen. Those on *Amelanchier* followed the sowing of *G. macropus*; but, since that plant supports three species of *Roestelia*, it was impossible to say to which one of these it belonged. The spermogonia which made their appearance on *Crataegus tomentosa* followed the sowing of three species of *Gymnosporangium*—*G. macropus*, *G. globosum* and *G. biseptatum*, yet not one of these is the species which, according to Oersted, ought to produce *R. lacerata*, which is our common form on *Crataegus*. Taking into consideration the results of these cultures, together with certain facts in regard to the distribution of our species, Prof. Farlow is led to the conclusion that, even granting the general correctness of Oersted's supposition that the *Roesteliae* are genetically connected with the *Gymnosporangia*, proof is as yet wanting to show the connection in the case of given species. Furthermore, if it should be shown, says the author in conclusion, that, as appears to be the case with *R. aurantia*, several of our *Roesteliae* are perennial—a fact true with regard to most of our *Gymnosporangia*—and that they grow in regions remote from species of *Juniperus* and *Cupressus*, then one could not help feeling that any connection between the two genera was probably accidental rather than genetic.

Whatever may be the result of future investigations into the genetic relationship of the two genera here monographed, botanists are to be congratulated, at least, that the opening of the question in the present instance, has resulted in giving them so valuable a contribution to the systematic portion of our mycological literature.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VIII.] New York, July, 1881. **[No. 7.**

§ 68. **New Species of North American Fungi.**

By J. B. Ellis.

Peziza (Dasyscyphae) campanula.—Pulvinate, sessile, a little more than one line high, and, when open, about one line broad, covered with a dense coat of fine, snow-white, crisped hairs; disk light rufous or flesh-color, bell-shaped, contracted when dry and concealed by the dense fringe of hairs; asci sessile, .001′x.0002′; paraphyses(?); sporidia biseriate, oblong, obliquely apiculate at one end, hyaline, .0003′x.000065′. Substance of the cup thin and of a fibrous texture.

A most beautiful species. When fresh,the bell-shaped or short-cylindric cavity of the disk gives it the aspect of *Solenia.*

On quaking ash, Pleasant Valley, Utah. S. J. Harkness.

Peziza (Tapesia) prolifica.—Gregarious, sessile, minute, densely clothed with septate, coarse, spreading, cinereous hairs; disk cup-shaped, dark, margin entire; asci clavate, spore-bearing part about .001′ long; sporidia biseriate, cylindrical, curved, obtuse, nearly hyaline, .0003′–00035′x.0001′.

The hairs appear brownish under the microscope, but ash-colored to the naked eye.

On the end of a piece of oak firewood. December.

Peziza nyssaegena.—Stipitate, brown, concave, 1-4th inch, or a little less, across, margin paler, obtuse, stipe 1′—2′ long, mostly flexuous, half a line thick; asci cylindric, .0047′x.00035′; paraphyses linear, rather stout, not thickened above; sporidia uniseriate, elliptical, hyaline, .00045′x.0002′.

The stem is thicker and stouter than that of *P. incondita*, which is also of a paler color.

On old nutlets of *Nyssa multiflora* buried in mud and decaying leaves in swampy ground. September. (Ellis, in *N. Am. Fungi*, No. 389.)

Peziza (Hymenoscyphae) simulata.—Gregarious, stipitate; disk circular, plane or slightly umbilicate, dull watery-white, 1-8th inch across, thin, becoming concave in drying. Stipe about 1-8th inch high, smooth, slightly contracted and darker below; asci abundant, sessile, cylindrical; paraphyses linear; sporidia elliptical, hyaline, about .0005′ long.

The stipe arises directly from the leaf, mostly from the veinlets, and is not attached to any sclerotium. When young the whole plant is milk-white.

On decaying maple-leaves lying on wet ground. June.

Peziza incondita.—Solitary, stipitate, pale chestnut-color; disk plane or convex 1-8th to 1-4th inch across, without any distinct margin; stipe central, erect, brownish, about half an inch high, firm; asci cylindrico-clavate, sessile, about .003′ long; sporidia 4 in each ascus, elliptical or ovato-elliptical, hyaline, .0004′–.0005′ long by .00025′–.0003′ wide.

The stem arises from a narrow, cup-shaped, black sclerotium, the origin of which I have not yet been able to determine. The sclerotium is of the same shape as that which originates in the petals of *Magnolia* and produces *Peziza gracilipes*, Cke., but is larger (1-4th inch across) and lies loose among mosses. The *Peziza* itself much resembles the last-named species, but is distinguished therefrom by its shorter, thicker stem, its larger size throughout, and its tetrasporous asci.

Among moss in swampy woods. June. (Ellis, in *N. Am. Fungi*, No. 391.)

PATELLARIA CLAVATA.—Scattered, sessile, patelliform; disk slaty-black, .02′ diameter, margin not distinct; asci broadly clavate, .005′x.0008′; paraphyses thickened and brown at the tips; sporidia biseriate above, oblong-elliptical, hyaline, 3-septate and, when mature, .00085′x.0003′.

On old culms and leaves of *Andropogon*. Iona, New York, September, 1879. (Ellis, *N. Am. Fungi*, No. 446.)

PATELLARIA IMPERFECTA.—Minute, .015′ diam., orbicular, sessile, black, margin paler and almost obsolete; asci oblong-cylindric; sporidia biseriate, cylindric-fusiform, 1-septate, subhyaline at first, becoming reddish-brown, .00045′—.0005′x.00015′.

On old corn stalks. September.

PATELLARIA TUBERCULOSA.--Scattered, sessile, turbinate, .02′ diameter, soft, tuberculose, dirty-white, externally darker, substriate, margin obtuse, not prominent; asci oblanceolate-clavate, .0005′—.00055′x.0006′; paraphyses rather stout, simple or branched, thickened above; sporidia biseriate, oblong-elliptic, 3-septate, .0008′—.0009′ x.00025′.

In the fresh state the disk is swollen so as to conceal the margin and outer surface, and the whole resembles a globule of transparent gelatine; but, when dry, the dark exterior closes over the contracted disk so that the latter appears nearly black.

On old decaying leaves of *Andropogon*. September. (Ellis, *N. Am. Fungi*, No. 399.)

OMBROPHILA AUREA.—At first obconic and concave above, at length becoming plane or convex, with a subundulate margin, 1-16th to 1-8th inch across, golden-yellow, soft; asci cylindrical, narrowed at the base, .0048′x.0004′; paraphyses linear, yellowish; sporidia uniseriate, acutely elliptical, binucleate and, at length, 1-septate, .0005′—.00055′x.000175′.

In swamps, mostly on decaying cedar limbs lying partly in water; and also on old leaves and rubbish. June and September. (Ellis, *N. Am. Fungi*, No. 395.)

DIATRYPE MICROSPORA.—Stroma tuberculiform, 1-4th inch across, of a dirty olivaceous-black; perithecia 15—20, deeply immersed in the stroma, oblong, leathery, closely packed; ostiola papillate, slightly prominent; asci linear, narrow, with a slender stipe, .0015′—.0017′x.0002′; sporidia uniseriate, oblique, oblong, obtuse, with a faint nucleus, pale-brown, .00015′—.0002′x.000075′.

On *Alnus*. Wells, Me., Rev. J. Blake.

DOTHIDEA MUHLENBERGIAE.—Stroma tuberculate, rough, covered at first by the epidermis, often seriate by confluence; ostiola papilliform, with a rather large aperture; cells of medium size, containing the cylindrico-clavate, 8-spored asci, which are .0025′x.0007′; sporidia biseriate, oblong-elliptical, hyaline, 4-nucleate, constricted near the middle, .0008′x.00025′—.0003′.

On dead culms of *Muhlenbergia*. June.

§ 69. **Notes from Utah.**—The leaves of *Sambucus glauca*, Nutt., are occasionally twice-pinnate at the base.

Zauschneria Californica, Presl, is quite oily, especially when growing in dry situations.

In 1878 I found in Colorado a *Helianthemum* which appears to be new, but from lack of material I could not determine it. It grows in clumps at the base of the foothills, and has large yellow flowers.

Peucedanum graveolens, Watson. This is the "Indian root" so much used as an external application in diphtheria.

Brickellia linifolia, Eaton, varies much. At Frisco I have found many specimens with short and broad leaves, but agreeing well with the figure and description in other respects.

Some forms of *Chrysopsis villosa*, Nutt., are certainly glandular; I have them from both Colorado and Utah. The specimens cannot be *C. sessiliflora*, for the corolla is always glabrous. The heads are involucrate.

I have *Erigeron argentatum*, Gray, with purple ligules.

Wyethia amplexicaulis, Nutt., has a very resinous root and is called "arnica" by the Mormons, who consider it a valuable medicine.

Iva xanthiifolia is not native to Utah, though it is widespread now. Two years ago it was not known in Salt Lake City, but now it is almost as common as is *Erigeron Canadense* in the East.

Tragopogon porrifolius, L., is also becoming a pest in the meadows, and is thoroughly established.

I have what appears to be *Lygodesmia exigua*, Gray, from Frisco. It was discovered by Wright in New Mexico, and has never been found since, as far as I can learn.

If the number of *setae* is a test, I have a new species of *Malacothryx*. Bristles *two*, on the inner angles of akene, enlarged at base: akenes linear prismatic, five ribs very prominent, the two intermediate ones less evident; scarious crown 15–20-denticulate; chaffy awns few; scales acuminate or very acute, scarious-margined; flowers yellow; leaves runcinate. It closely resembles *M. sonchoides*.

Centaurea Melitensis, L., is established here.

I have *Crepis acuminata*, *C. occidentalis* and the var. *crinita* from Frisco.

I have *Gentiana simplex* from Soda Lake, in Southern Idaho.

Polemonium humile, var. *pulchellum*, is not rare in the mountains near this city.

Nemophila breviflora has alternate, as well as opposite leaves.

Phacelia cephalotis occurs as far north as Milford.

Collomia aggregata, var. *attenuata*, is the most common form of that species in the high mountains here, though the flowers are seldom "spotted."

It is well to notice that the shape of the sterile filament in *Scrophularia* is not now considered to be a test in determining species. I sent to Dr. Gray, specimens of *S. Californica* in which the filaments varied much. I have this plant from Colorado also.

Pentstemon Eatoni, Gray, has the corolla also 1½″ long, pedicels 4″–6″ long; sepals half as long; peduncles sometimes 6″ long, 5 to 8-flowered; pods ovate, acuminate, 6″ long by 4″ broad. It is three feet high, with spikes 18 inches long in my Frisco specimens.

Pentstemon azureus, Benth., var. *Jaffrayanus*, Gray, is often not at all glaucous.

Scutellaria antirrhinoides is not uncommon at Ogden. I believe it has not been reported east of Nevada before.

Echinospermum subdecumbens, Parry. Dr. Parry called my attention to this plant, which Gray refers to *E. floribundum*. At first it appears to be very distinct, meriting a specific rank, both on account of the nutlets and its perennial root. But higher in the canyons it is more frequently biennial, and has both smooth and prickly-faced nutlets, and certainly unites *E. floribundum* and *E. deflexum* as Watson decided in King's Report.

Eritrichium circumscissum, Gray, is abundant at St. George. It has a strong purple coloring-matter. There are several species of *Eritrichium* occurring at St. George that have so strong a purple dye as to color through the papers in which they are dried.

Atriplex confertifolia, Watson, has an oil which the Mormons use for the hair. The plant goes by the name of "white sage."

Juniperus Californica, Carr., var. *Utahensis*, Eng., Watson reports (as *J. occidentalis*) from Nevada in King's Report, and appends the remark that he did not meet with it in Utah! This must be a mistake, for on Antelope Island, where much of his Utah botanizing was done, there is a belt of this plant extending nearly from one end of the Island to the other on both sides. In company with Dr. Englemann, I found it at Ogden, and have since found it at the mouth of Parley's Canyon, near Salt Lake City, and at the foot of Bear Lake, in the extreme north-eastern corner of the Territory.

Calochortus flexuosus, Watson, is a most lovely plant.

Polypogon Monspeliensis occurs as far south as St. George, and appears to be an introduced plant.

I have discovered in the canyons of the Wasatch, *Salix lesiandra*, var. *Fendleriana*, *S. flavescens* and *S. rostrata*.

Eriocoma cuspidata is the prevalent grass of the desert region of Western Utah, and is highly valued as a forage plant by the freighters.

I have *Stipa speciosa*, Trin. & Rup., from St. George and Frisco.

A plant found in City Creek Canyon Dr. Vasey thinks is a new variety of *Festuca pauciflora*, but lack of ripe fruit makes it somewhat uncertain.

Salt Lake City, Utah. MARCUS E. JONES.

§ 70. **Stamens within the Ovary of Salix.**—The frequency of abnormal development in the floral organs of our *Salices* this season, seems quite remarkable. Within an area of less than a mile I have noticed perhaps a dozen individuals exhibiting various phases of abnormal growth. The tendency towards transformation of stamens into pistils, and *vice versa*, has been frequent, and I have also noticed the surprising phenomenon of anthers developed within the closed ovary! Briefly stated, the course of this development so far as I was able to trace it, by an examination of various ovaries in different stages, borne on the same catkin, was as follows: On the upper portion of the inner walls of the ovary, just above the ovules, a pair of slender parallel folds appear in the tissue on either side, gradually increasing in size until one of them has developed into a perfect poliniferous anther-lobe. Up to this point the ovary remains otherwise unchanged (except in the obsolescence of the silky hairs of its outer surface) and a lateral section shows the ovules occupying the lower part,on basal, or partially parietal placentae—some of them being actually contiguous with the yellow, often red-tinged, anther-lobes above. At about this stage the ovary begins to separate between the styles, and an orifice is formed which reveals the anthers within. The latter, as the separating process continues, are brought out on the diverging portions of the ovary, which, undergoing gradual atrophy, finally becomes a hyaline filament bearing two perfect anthers at its apex. In some cases, the anthers were separated by a partial division of the filament —a direct effort towards the normal diandrous state.

In many instances the affected parts were found to be shrivelled after having undergone a partial change, and developing ovaries were found still containing a remnant of the anther.

In another case the ovaries were borne on slender drooping pedicels, thus showing some relationship to stamens; and, though these had not split, most of the catkins bearing them were partially divided through the axis. In this specimen, at the expense of the ovules, their usual downy coverings had been greatly developed, often extruding as a dense cottony mass through a rupture in the walls of the receptacle.

Still another abnormal condition of the floral organs was noticed in the complete gradation, in several shrubs, between a single ovary and two diverging ones borne on the same pedicel.

The affected species were mostly *Salix discolor*, Muhl., with one or two plants of *S. cordata*, Muhl.

Riverdale, New York. E. P. Bicknell.

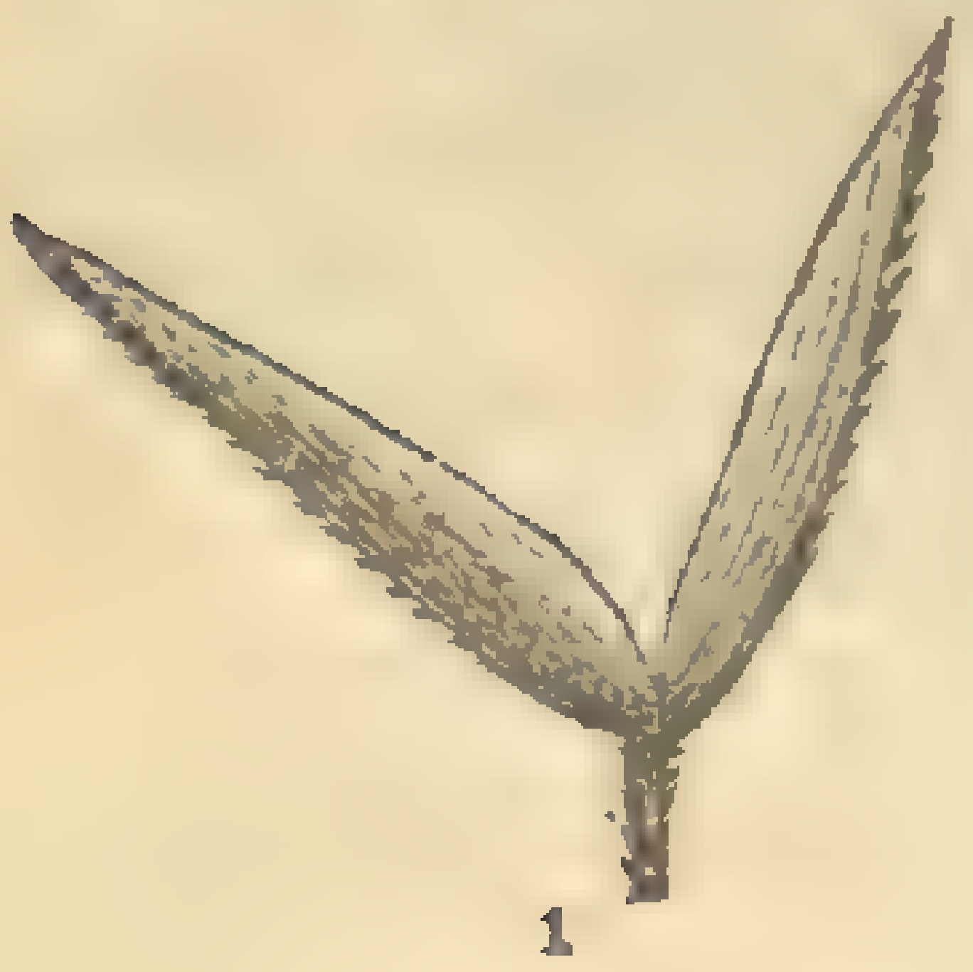
§ 71. **Notes on a Few of our Carices.**—It seems to me that Prof. Gray was not at all out of the way, when, in his Gramineae and Cyperaceae, he classed *Carex varia*, Muhl., as a variety of *C. Pennsylvanica*, Lam. Unlike as these two plants appear to be when answering to their respective descriptions, yet, when compared with their several variable forms, their differential points wholly fail and separation becomes guess-work. Among my specimens of *C. Pennsylvanica* there are several with spikelets quite as distinct as are those of the typical *C. varia*, while others have light-brown scales and obovoid perigynia. On the other hand, *C. varia* has its spikelets sometimes approximate, its perigynia roundish, and its leaves very long and slender. It is hoped that competent observers will examine these variant forms and record their conclusions.

Carex Emmonsii, Dew., with *dark-purple spikelets*, is not uncommon in woods about here. Presumably, this is what Dewey called *C. Novae-Angliae*, and regarded as common, as he paid no attention to the ripened achenia or styles, which Dr. Boott so carefully noted. The persistent style is a constant character of *C. Novae-Angliae.*

Last year I collected, on the hills of this city, numerous specimens of *Carex conoidea*, Schk., in which the bracts exceeded the culms—or rather in which the stalks of the staminate spikes were considerably shortened. Neither insects nor disease had produced this result..

Yonkers, N. Y. E. C. Howe.

§ 72. **Cohesion of Glumes in Agrostis elata,** Trin.—In No. 4,954 of Bolander's collection of 1866, some peculiarities of development in the flowers occur which seem worth noting. The plant is a grass, ticketed incorrectly, however, *Agrostis vulgaris*, With. It is the same as No. 6,103 of the same collection, which Dr. Thurber has referred to *A. elata*, Trin., in the Botany of California, Vol. ii, p. 274. The peculiarities referred to consist in the malformation or abnormal growth of both the empty and flowering glumes. Some of the spikelets appear to be double from being borne on two pedicels which are united to their tips. The four empty glumes arising from this compound or double pedicel, form a single whorl and are wholly distinct, or are more or less united to each other by their margins. Fig. 2 illustrates four of these empty glumes, belonging evidently to two spikelets. The two lower of these—what would constitute the lower empty glumes of two spikelets if normally developed, are entirely separate, while the corresponding upper ones are united nearly to their tips by one of their margins. A few of the spikelets are reduced to two, small, imperfectly-formed, empty glumes, as shown in Fig. 3. In most of the spikelets examined the flowering glume (palet) was normal in its characters; but closely folded within this, apparently occupying the position of a palea, was what could only be regarded as a second flower-glume, having a minute but distinct callosity, sessile upon that of the first flower, and a distinct midvein, minutely scabrous above. In almost every instance this second flowering glume was bent or folded down at the top, as in Fig 4, where it is pulled out in order to show it more distinctly. The figures are drawn on a scale of one inch to the line.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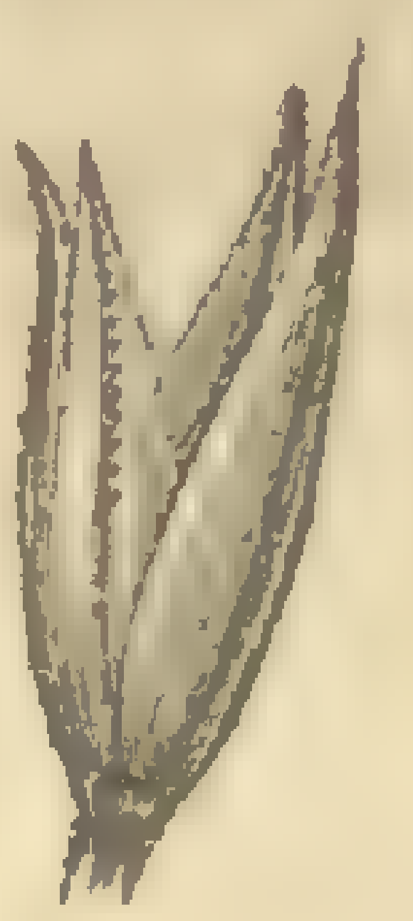
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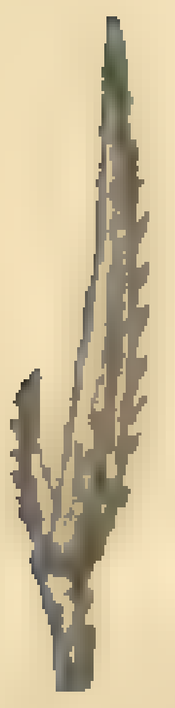
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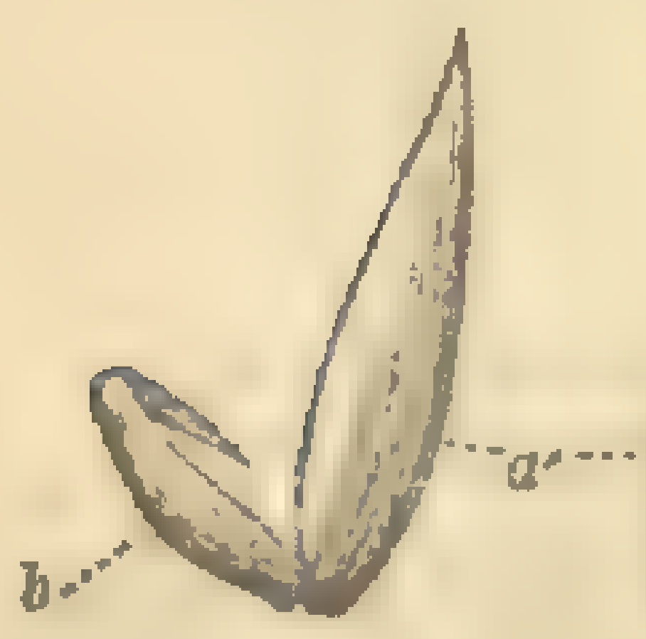

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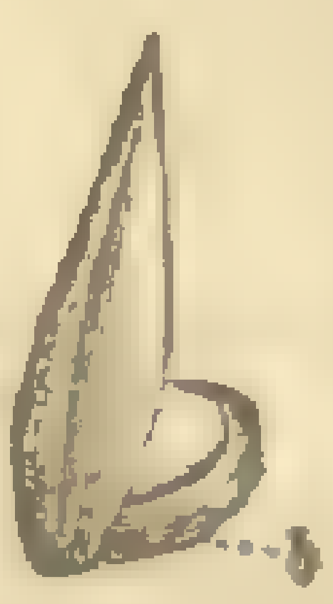

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Girard College, Philadelphia. F. Lamson Scribner.

§ 73. **The Ferns of New York State.**—The untiring zeal of botanists in all sections of our country is causing great changes in our knowledge of the geographical distribution of species. The fact that no less than five species of ferns[*] have been discovered within the geographical limits adopted for Gray's Manual, since the publication of the last edition, is sufficient evidence that our botanists are neither idle nor allowing much territory to remain unsearched.

New York State, from its diversity of favorable conditions, can justly claim the first rank in the richness and extent of her fern treasures. Other States may surpass her in a singular particular: Alabama produces the smallest fern (*Trichomanes Petersii*); California produces the richest, in the "golden-back" (*Gymnogramme triangularis*); Florida produces the most anomalous, in *Vittaria*, *Ceratopteris* and *Ophioglossum palmatum*; but no State can excel New York in number of species, variety, richness or profusion.

The States which approach nearest in number of species are California and Florida. The former has the advantage of an extent of ten degrees of latitude against four degrees in New York, and the nearer approximation to an insular climate which favors fern growth. The latter (Florida) has the advantage of a semi-tropical climate peculiarly adapted to this order of plants.

It would be interesting to compare the fern growth of all our States and Territories, yet this can hardly be done in the present state of our knowledge of distribution. The following, however, may be safely compared: New York, 52 species; California, 46 species; Florida, 42 species; Kentucky, 39 species; Illinois, 37 species; Arkansas, 37 species; Michigan, 30 species; Texas, 27 species; and Arizona, 24 species.

Of the forty-six species found in California, ten are shared in common with New York, and fourteen of the Florida species also occur in New York. Of the thirty-one genera of American ferns, nineteen are found within the limits of New York; Florida can boast an equal number, yet she monopolizes all the species of five genera, viz.: *Acrostichum*, *Vittaria*, *Blechnum*, *Ceratopteris* and *Nephrolepis*. California has representatives of only seventeen genera.

The list[†] enclosed gives the ferns of New York State as far as known.

Bloomington, Ill. **Lucien M. Underwood**

§ 74. **Note on Mertensia Virginica.**—The account of *Mertensia Virginica*, DC. (*Pulmonaria* of Linnaeus), in the May number of the Bulletin, by my friend Dr. Lockwood, of Freehold, N. J., is very interesting.

It is, indeed, a thing to excite wonder that this plant, so often found in cultivation, should not have firmly established itself in New Jersey, which possesses a climate and a soil so favorable to its growth. Its home is in the South-west; but it has grown freely without cultivation for years in Eastern Pennsylvania, a few miles west of the Delaware River.

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[*] *Adiantum Capillus-Veneris*, L., *Asplenium viride*, Huds., *A. Bradleyi*, Eaton, *Woodsia hyperborea*, R. Br., and *Botrychium matricariaefolium*, R. Br.

[†] As the list sent by Prof. Underwood is, with few exceptions, the same as one given by us on page 268, Vol. vi, of the Bulletin, we have thought it unnecessary to repeat it here. The additions made by him to that list are *Asplenium Bradleyi* and *A. ebenoides* (detected within the State more recently), and the varieties *obliquum* and *dissectum* of *Botrychium ternatum*. The latter we inadvertently omitted. —Eds.

Years ago it grew in the fields near Worth's Mills, south of Princeton, from which it has totally disappeared, no trace of it being now to be found in all that region. Its presence near Walnford is no doubt due to the introduction from the West of seeds in grain, the most efficient agent for plant distribution in all cultivated regions. The strong roots alluded to by Dr. Lockwood are common to many herbaceous perennials.

White Plains, N. Y. O. R. WILLIS.

§ 75. **Tiarella cordifolia.**—I should be glad to know whether this plant ever seeds freely anywhere; whether there are often more than one or two seeds in a capsule; whether it is often seen with leaves on the scape; and whether, when the scape is foliaceous, it is more or less productive than in its usual state? Some facts noted on the plant in North Carolina, and which I hoped to re-examine in northern plants this season, lead me to make these inquiries. So far, this year, I have only been able to observe a few cultivated plants.

Germantown, Philadelphia. THOMAS MEEHAN.

§ 76. **The Herbaria and Botanical Libraries of the United States, VII.**—THE MUHLENBERG HERBARIUM.—Rev. Henry Muhlenberg, D.D., was one of the earliest American botanists, and by his careful training in the schools of Germany, was specially fitted for successful work in a field where qualified laborers were rare. His death, which occurred May 22, 1815, at the comparatively early age of 62, was a great loss to the scientific world. Among his intimate friends and correspondents was Zaccheus Collins, a merchant of Philadelphia, well known in his day as a promoter of good works, and as an assiduous cultivator of natural science. The efforts of Mr. Collins, seconded by the influence of Dr. Wistar, Mr. Vaughan and others* secured the sum of five hundred dollars for the purchase from the son, Dr. F. A. Muhlenberg, of his father's herbarium for the American Philosophical Society in Philadelphia, which, in 1816, received possession and still retains it.

With good judgment, that Society has not permitted the arrangement to be disturbed, and it remains as left by the original owner. The phanerogamic plants and the ferns are enclosed in boxes or wooden books with sliding covers, and the plants are laid in sheets of the diminutive size usual in early herbaria. The lower cryptogamic plants are in smaller paste-board envelopes, and are accompanied with lists. The arrangement, of course, is that of the Linnaean sexual system, and as this is one of the few collections which illustrate the early history of American botany, it is hoped that this arrangement will not be changed. The plants are mostly in fair preservation.

The collection has great interest as connected with the labors of a pioneer botanist. As a collection, it would, at the present day, be deemed of small account, but, as containing the material on which Dr. Muhlenberg's labors were based, it must always have historic value. Even now the leading workers in descriptive botany have occasionally to recur to these vouchers for needed evidence; but their value is much diminished by the fact that for the most part, no record of the locality is preserved, and that, in frequent instances, different species are laid together under the same name.

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*In the Collins correspondence, in possession of the Academy of Natural Sciences, is the rough draft of a subscription-paper which gives reason to believe that the contributors to the purchase were Wistar, Collins, Vaughan, Pollock, Short, Dorsey, James, Chapman and Tighlman.

J. H. R.

§ 77. **Idaho Plants.**—The acknowledgments of the *Torrey Club* are due to Dr. T. E. Wilcox, U.S.A., of Boisee City, Idaho, for several packages of plants of that vicinity collected in April and May of this year. Many interesting species are represented; among them, *Delphinium decorum*, var. *Nevadense*, Watson; *Brodiaea laxa*, Watson; *Fritillaria pudica*, Spreng.; *Allium Nevadense*, Watson; *Balsamorrhiza Hookeri*, Nutt.; *Antennaria dimorpha*, T. & G.; *Crepis occidentalis*, Nutt.; *Lupinus Chamissonis*, Eschs.; *Mertensia oblongifolia*, DC.; *Plectritis congesta*, DC.: also a dwarf primrose of the same general size and habit as *Primula angustifolia*, but having a from 1-5-flowered scape and showing also marked differences in the inflorescence from that described by Dr. Gray. Prof. Wood regarded this as a variety of *P. Parryi*, Gray, and named it var. *Wilcoxiana*. It appears to be the same as var. *Cusickiana*, Gray, of *P. angustifolia* (*N. A. Flora*, p. 393) except that the last-named variety is described as only 2-flowered. *P. angustifolia* flourishes in its typical, 1-flowered form, on high mountain elevations, such as Gray's and Pike's Peak, at 11,000 ft. to 13,000 ft., where we have found it abundant. The many-flowered forms grow at much lower elevations (where *P. Parryi*, a much larger species, is found) but the foliage shows no marks of any greater vigor in the plants. It is possibly a distinct species.

A. B.

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§ 78. Contributions toward a List of the State and Local Floras of the United States.

(VIII-16

THE MIDDLE STATES.*

NEW JERSEY.

Catalogue of Plants growing without cultivation in the State of New Jersey, with a specific description of all the Violets found therein. By O. R. Willis. (C.)
12mo. pp. 71. New York, 1874. (Enlarged edition, New York, 1877.)

96 List of New Jersey Fungi. By M. C. Cooke and J. B. Ellis. (C.)
In Grevillea, Vols. iv, v, vi, vii and viii, London, 1876–80.

Monmouth and Ocean Counties.

97 Catalogue of Plants growing without cultivation in the Counties of Monmouth and Ocean. By P. D. Knieskern, M.D. (B.)
In 3d Annual Rep. Geol. Survey, Trenton, 1856.

PENNSYLVANIA.

Flora of Pennsylvania and Botanical Pocket Manual. By H. R. Noll. (D.)

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*Continued from page 19.

12mo, pp. 466. Philadelphia, 1851.

Sketch of the Botany of Pennsylvania. By Thomas C. Porter .(B)
From Walling & Gray's Topographical Atlas of Pennsylvania. Folio, with map, showing distribution of the plants. Philadelphia, 1872.

Bucks County.

An enumeration of the indigenous and naturalized Plants found growing in Bucks County. By J. S. Moyer, M.D.
8vo, pamph. pp. 28. Doylestown, 1876.

Chester County.

Florula Cestrica; an essay towards a Catalogue of the phaenogamous Plants, native and naturalized, growing in the vicinity of the borough of West Chester. By Wm. Darlington. (D.)
8vo. pp. 152. West Chester, 1826.

Flora Cestrica; an attempt to enumerate and describe the flowering and filicoid Plants of Chester County, in the State of Pennsylvania. By Wm. Darlington. (D.)
1 vol., 8vo. West Chester, 1837. (Enlarged edition, Philadelphia. 1853.)

Cumberland County.

Contributions towards a Catalogue of the Trees and Shrubs of Cumberland County. By Spencer F. Baird.
In Rec. and Jour. Linn. Assoc. Pennsylv. Coll. Vol. i. 1845.

Lancaster County.

Index Florae Lancastriensis. By Henry Muhlenberg. (A.)
In Trans. Amer. Philosoph. Soc. Vol. iii, 1st ser. Philadelphia, 1793.

Supplementum Indicis Florae Lancastriensis. By Henry Muhlenberg. (A.) (ibidem) Vol. iv, 1st ser.

A Catalogue of the filicoid and flowering Plants of Lancaster Co., arranged in conformity with Endlicher's Genera Plantarum. By Wm. Darlington. (A.)
In Rupp's History of Lancaster Co. Lancaster, 1844.

Enumeration of the indigenous and naturalized Plants found growing in the County of Lancaster. By Thomas C. Porter. (B.)
In Mombert's Authentic Hist. Lancaster Co. Lancaster, 1869.

Philadelphia County.

Compendium Florae Philadelphicae; containing a description of the indigenous and naturalized Plants found within a circuit of ten miles around Philadelphia. By William P. C. Barton. (D.)
2 vols., 12mo, pp. 252 and 234. Philadelphia, 1818.

Florae Philadelphicae Prodromus. By William P. C Barton. (D.)
4to, pp. 100. Philadelphia, 1815.

List of Plants found in the neighborhood of Philadelphia, Feb. to Oct., and list of Ferns, By Dr. Darrach. (A.)
In Proc. Phila. Acad. Sci. 1860.

On Colonies of Plants observed near Philadelphia. By Aubrey H. Smith. (B.)
In Proc. Phila. Acad. Sci. 1867.

Foreign Plants introduced in the vicinity of Philadelphia. By I. C. Martindale.

In Botan. Gazette, Vol. ii. Logansport, 1876.

List of Plants recently collected on ships' ballast in the neighborhood of Philadelphia. By Isaac Burk. (B.)

In Proc. Philada. Acad. Sci. 1877.

Northampton County.

List of the rarer Plants found near Easton. By L. De Scweinitz. (A.)

In Amer. Jour. Sci. and Arts, 1 ser. Vol. iii. 1824.

Catalogue of Botanical Specimens collected by J. Wolle and A. L. Huebener during the year 1837 in the vicinity of Bethlehem and other parts of Northampton County. (A.)

In Amer. Jour. Sci. and Arts, 1 ser. Vol. xxxvii. 1839.

Fresh Water Algae collected during three years, mostly within a circuit of about twenty miles around Bethlehem. By Francis Wolle. (C.)

In Bullet. Torr. Club. Vol. vi. 1876.

DELAWARE.

New Castle County.

Catalogue of the phaenogamous and filicoid Plants of New Castle County. By Edward Tatnall. (B.)

Pub. by Wilmington Inst. 8vo, pamph, pp. 112. Wilmington, 1840.

Catalogue of the phaenogamous and filicoid Plants of New Castle County.

Pub. by the Botanical Soc. of Wilmington. Pamph. Wilmington, 1844.

MARYLAND.

Baltimore County.

Catalogue of phaenogamous Plants and of Ferns, native and naturalized, growing in the vicinity of Baltimore. By Wm. E. A. Aiken, M.D. (B.)

In Trans. Md. Acad. Sci. Vol. i, Baltimore, 1837.

DISTRICT OF COLUMBIA.

Florula Columbiensis. (Anonymous.)

Pamph. Washington, 1819.

Prodromus of the Flora Columbiana. By J. A. Brereton, M.D. (A.)

16mo, pp. 86. Washington, 1830.

Flora Columbiana, or Catalogue of Plants growing without cultivation, collected by the members of the Potomac-side Naturalists' Club in the District of Columbia and its immediate vicinity. (A.)

From Field and Forest. 8vo, pamph. Washington, 1876.

Mosses of the District of Columbia. By Rudolph Oldberg. (A.)

In Field and Forest. Vol. ii, Washington, 1876.

W. R. G.
N. L. B.

§ 79. **Botanical Literature.**—*Our Native Ferns and How to Study them*: with Synoptical Descriptions of the North American Species. By Lucien M. Underwood, Ph. D. (Illustrated). Bloomington, Ills. 1881. It is remarkable, considering the length of time ferns have been popular objects of interest and study, that there should not have been until now any low-priced hand-book containing a complete account of our native ferns that could be used for the determination of the species. In the present work the author gives us short chapters on habits and distribution, morphology, fructification, germination, structure, classification and nomenclature, how to study ferns, and fern literature, then the classification and description of the North American species. There is also an excellent glossary of technical terms, and one of specific names, and a copious index. The illustrations, although not of superior excellence, convey all the information required. Great care has evidently been expended upon the key to the genera and species, which has readily taken us to the plants as far as tried. It is to be regretted that the chapter on the literature of ferns is so brief, as it could have been extended; and we notice that the name of Mr. C. E. Faxon, who drew the plates for the second volume of Eaton's Ferns, and decidedly the best plates in that work, is omitted entirely from the notice of that book. Mr. Underwood is to be congratulated upon the success of his work, and it is to be hoped that he will soon have cause to prepare a second and perhaps enlarged edition.—J. R., Salem, Mass.

§ 80. **Proceedings of the Torrey Club.**—The regular meeting of the Club was held at the Herbarium, Columbia College, Tuesday evening, May 10th, the President in the chair and twenty-six members present.

Miss Knight read a list of 28 plants found during the field meeting, May 7th, at Bronxville This locality was found to be a new station for *Dentaria diphylla* and *Mitella diphylla.*

Plants exhibited.—Mr. W. F. Miller exhibited an interesting collection of Alpine plants. Dr. Kunze, in behalf of Mr. I. S. Buchanan, distributed flowering specimens taken from a graft grown from the noted pear-tree which, up to the time of its destruction in 1867, stood on the corner of Third Avenue and Thirteenth Street, a locality in the early history of the island forming a portion of the farm of Petrus Stuyvesant, the last Dutch director general of New Netherland (New York). Mr. Bicknell exhibited and remarked upon the following

Teratological specimens :—*Dicentra Cucullaria*, DC., showing fission of the scape as far as the flowering portion extended ; *Anemone Hepatica*, L., having three flowers, subtended by a common involucre, at the apex of the scape; catkins of *Salix*, some of which were proliferous and bore two diverging ovaries on a common pedicel, and one of the specimens, moreover, bearing ovaries, within many of which were found poliniferous anthers.

Mr. Brown remarked on the similarity of habit of several *Compositae*, such as *Anthemis Cotula*, DC., *Anthemis arvensis*, L.. *Matricaria Chamomilla* and *Chrysanthemum inodorum*, and gave some practical hints as to how they might be readily distinguished from each other.

The presentation, by Mr. Willis, of specimens of *Cypripedium pubescens*, from White Plains, gave rise to a discussion on the subject of orchids which consumed the remainder of the evening.

The resignation of Mr. Schrenk as a member of the field-day committee was accepted, and Dr. Schöny was appointed in his stead.

One active member was elected.

ERRATUM.—In the June number, page 68, thirtieth line from top, the word "as" should be inserted between "ascending" and "when," to give the sense the author intended.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VIII.] New York, August, 1881. **[No. 8.**

§ 81. Notes on Gymnosporangia.

By W. G. Farlow.

Since the publication of my paper on the *Gymnosporangia* of the United States I have received several communications with regard to the distribution of our species; and, as one of my principal objects was to investigate the supposed genetic connection between the genera *Roestelia* and *Gymnosporangium*, any information with regard to the distribution of the species of the two genera is of interest. At the time when my paper was originally presented to the Boston Natural History Society I had never seen specimens of *Gymnosporangium speciosum*, Peck, described in the *Botanical Gazette* of October, 1879. Recently I have received fresh material from Mr. T. S. Brandegee, by whom the species was originally discovered on *Juniperus occidentalis*, in Colorado. The specimens received show fusiform swellings of the branches and irregularly-flattened sporiferous masses of the pale yellow color usually seen in specimens of the genus which have been expanded by rains and then dried. The species is evidently closely related to *Gym. biseptatum* and intermediate between it and *Gym. clavipes*. It resembles the former in the distortions produced, and in the general appearance of the sporiferous masses; and the spores, although larger and on stouter pedicels, are frequently composed of three cells as in *Gym. biseptatum*. The spores germinate at the septum, and I have seen no case of germination at the apex as is usual in *Gym. clavipes*. *Gym. speciosum* should be added to the number of species enumerated in my paper, but its relations to any species of *Roestelia* cannot, at present, be discussed because the mycological flora of the Rocky Mountains is still too little explored.

Some instructive specimens have also been received from Dr. J. H. Mellichamp, collected at Bluffton, S. C. Amongst others, are specimens which approach more nearly the true *Gym. fuscum* of Europe than any that I have examined from the Northern States. The specimens in question were on *Juniperus Virginiana*; and, besides the common globose form, there were two specimens in which fusiform enlargements of the branches were formed, and the sporiferous masses were quite similar to those found on junipers in Europe. It seems probable, then, that what I have called *Gym. fuscum*. var. *globosum*, is in reality merely a variety, and not a distinct species. In passing, I would remark that all the specimens sent by Dr. Mellichamp seem to indicate a more luxuriant development of the different *Gymnosporangia* in South Carolina than in the case of the same species when growing in New England. Thus, several specimens of *Gym. macropus* exhibit knots so large that the branch above is strangled, and the leaves distorted, whereas such is only very rarely the case in Eastern Massachusetts.

With regard to the prevalence of *Gym. macropus* in Illinois, Prof. T. J. Burrill writes as follows: "*Gymnosporangium macropus* is very common here (Champaign) on *Juniperus Virginiana*; and a *Roestelia* on the orchard apple and on *Pyrus coronaria* appears as common. But I do not find any interdependence between them. Junipers are not indigenous, and great areas, many miles in extent, exist without a specimen, yet the *Roestelia* seems to occur in such places as commonly as near the affected trees." Prof. W. R. Dudley writes that "at Bloomington, Ind., last spring, the cedar (*J. Virginiana*) was comparatively abundant both in and around the town, although not a native of the section. I think I never saw the *Gymnosporangium macropus* so abundant as on these trees. In the latter part of April, during certain rainy days, they were particularly noticeable, giving the branches an orange hue at a distance and weighing down the branches as much as two or three inches of light snow might. I noticed also there were many of the old apple carcasses of previous years." Mr. Wm. Trelease, also, informs me that he found *Gym. macropus* to be not rare in the vicinity of Madison, Wis.

In conclusion, a word as to the inferences which can logically be drawn from the relative abundance and proximity to one another of the different *Gymnosporangia* and *Rosteliae*. Because one finds, for instance, a certain *Gymnosporangium* on *Juniperus Virginiana* in the immediate neighborhood of apple trees which are attacked by a *Roestelia* is no proof whatever of any genetic connection between the two. One would undoubtedly also find an abundance of *Puccinia Graminis* near the same apple trees; and, although no one supposes any connection to exist between the *Puccinia* and *Roestelia*, yet, on logical grounds, we might just as well believe in a connection in the latter case as in the former. On the other hand, however, if we find a teleutosporic form, as *Gymnosporangium*, occurring in districts remote from the aecidial form, as *Rostelia*, we are warranted in inferring that there is no *necessary* connection between them. Now in the case of some of our species of *Gymnosporangium*, which are found also in Europe, it is certainly true that they occur only at very great distances from the *Roestelia* with which they have been associated by European botanists, and yet the teleutospore form itself is very abundant. The case of *Puccinia Graminis* is in this respect still stronger, for, although very common in the grain fields of the West, its supposed aecidium, which occurs only on the barberry, is there quite wanting. It may be said that, in the West, *Aecidium Berberidis* is replaced by some other *Aecidium*; but, what it is, is certainly not known, nor even suspected. Perhaps the strongest case is that of *Calyptospora Goeppertiana*, which grows on *Vaccinium*, and the aecidial stage of which is said by Hartig to be *Aecidium columnare*, which grows on firs. Although not rare in the Rocky Mountains and westward, the *Calyptospora* is certainly rare near Boston, and I have found it only once on a single plant of *Vaccinium corymbosum*, which grew in a deep swamp at Newton amongst *Cupressus thyoides*. The fungus was well developed on the *Vaccinium*, but it is impossible that the *Aecidium columnare* could have been present, as there were no fir trees anywhere to be found; and, in fact, I have never been able to detect *Aecidium columnare* anywhere near Boston. The species of *Uredineae* found in the neighborhood were *Gymnosporangium Ellisii* and *Gym. biseptatum*, which

For parallel cases in France [illegible]
[illegible]

could have had no connection with the *Calyptospora*. How are we to account for the presence of the *Calyptospora* on a moderate sized *Vaccinium* bush in a deep cedar swamp, if one of the necessary stages of its development is *Aecidium columnare*? Here then we have three different genera, including teleutosporic forms found both in Europe and this country, and yet what is assumed in Europe to be the necessary aecidial form is wanting with us. But certainly we must assume that, in matters of development, what is true of a fungus in one country must be true in another. In the present question, it will be observed that the cumulative character of the evidence is of value.

§ 82. Abnormal Habit of Asclepias amplexicaulis.

By H. W. Ravenel.

About ten years ago, in a note to Prof. Gray (which he afterwards presented with his comments at the meeting of the Amer. Assoc. for Adv. of Science in Indianapolis, 1871*) I called his attention to the seemingly one-ranked leaves of *Baptisia perfoliata*; and traced the cause of this anomaly to the peculiar attachment of the leaves to the stem. I have lately observed the same thing in *Asclepias amplexicaulis*—the only difference being that in the case of the latter the leaves are opposite—in the former, alternate.

The habit of *Asclepias amplexicaulis* is to throw out several (2 or 3 to a dozen) stout stems from the roots, all diverging at once and assuming a recumbent position. The stems are almost universally unbranched, and the inflorescence occupies the axils of the upper leaves. The stems being horizontally reclined, the leaves all assume a vertical position, exposing both surfaces alike to the sun.

The leaf arrangement is evidently distichous (phyllotaxis ½), and the twisting of the stem, alternately from right to left and left to right (the torsion taking place whilst the leaves are unfolding) brings them ultimately to a double, one-ranked series.

As in the case of *Baptisia perfoliata*, the alternate torsion of each internode in opposite directions can be traced on the stem, but is more clearly seen by stripping off a leaf with the adhering bark downward from one node to the next, when it is seen to pass spirally through half the diameter of the stem, from right to left and from left to right alternately through its whole extent, the torsion being pretty uniform through the internodal spaces. This alternate twisting in different directions relieves the stem of a continuous torsion through its entire axis. The equilibrium is thus restored, each alternate pair of leaves standing in its proper normal position. The upper pair of leaves, where the vegetative strength is nearly exhausted, is smaller, and retains very nearly its normal position at right angles with the next lower pair.

The specific name, *amplexicaulis*, is rather a misnomer if critically considered. The base of the petiole is not enlarged nor clasping. The thick, fleshy, succulent leaves are strictly cordate, with obtuse rounded points, the petioles so short that the auricles or lobes encircle the stem, thus giving the appearance of true amplexicaul leaves.

**Proceedings*, p. 391.

The peculiar habit of the plant presents some interesting questions in vegetable morphology.

1st. On the supposition that the stomata are about equally distributed on both surfaces--do the leaves assume this vertical position (as Dr. Gray queries in the case of *Baptisia perfoliata*) because the stomata are thus equally distributed—or are the stomata so arranged to suit the habit of the leaf?

2nd. What is the correlation between the recumbent position of the stem and the vertical position of the leaves?

The stems are stout, and apparently quite large and strong enough to support the foliage, if growing upright,—but in that position the sessile leaves with clasping auricles could not possibly bring both surfaces to the light. There is apparently no mode by which this can be accomplished but by these two abnormal processes operative together, the stem assuming a recumbent position, and the alternate twisting of each internodal space, to bring the leaves into their double one-ranked position. The whole habit of the plant seems therefore modified by the peculiar conformation of the leaves, their mode of attachment to the stem and their functional requirements.

I may state, in conclusion, that the root (perennial) is long, fleshy, unbranched (or rarely so) tapering downwards, with few or no fibrous rootlets, from 18 inches to 2 feet or more in length, and grows in poor sandy soil where other vegetation would hardly subsist. The whole plant above ground is highly ornamental. Aside from its unique habit, which would at once attract attention, the flowers of cinereous, ashen hue, have a soft delicacy of tint, which renders them objects of beauty; whilst the symmetrically disposed, large, fleshy leaves, with pinkish translucent midribs and laterals, anastomosing in every direction, contrast with the dark green of the parenchymous tissue and make it more attractive than many of the so-called "Foliage Plants" in cultivation. Held up to the light, when the ramifying net-work of veins may be seen extending throughout the green tissue, the leaf presents an object of marvellous beauty.

Aiken, S. C.

§ 83. Fern Notes. II.

By Geo. E. Davenport.

Taenitis lanceolata, R. Br. (*Lingua Cervina*, Plum., Amer. 28, t. 40; Fil. 116, t. 132. *Pteris lanceolata*, Linn.)—I have the pleasure of announcing the discovery of this interesting fern on Old Rhodes Key, Florida, in May last, by Mr. A. H. Curtiss, the well known botanical collector.

The history of the species is interesting as showing the various views held by different authors in regard to its generic distinction.

Originally described and figured by Plumier in 1693, it was afterwards removed to *Pteris* by Linnaeus, and by him named *Pteris lanceolata*, whence its present specific name.

Later, Robert Brown (Prodromus, p. 154, in obs.) excluded it from that genus and referred it to *Taenitis*, where it was subsequently placed by Kaulfuss, and latterly retained by Hooker and Baker.

J. Smith, however, breaks up the latter genus, distributes the different species in his Eremobrya and Desmobrya divisions, according as their vernation is "articulated" or "adherent," and adopts the present species as the type of Fée's genus *Nevrodium* (Hist. Fil).

Presl referred it to *Paltonium*; Desvaux, to *Pteropsis*; and Moore, to *Drymoglossum*, in accordance with J. Smith's earlier views. In view of the many changes which the species has already undergone, there is no certainty that it has yet reached a definite abiding place.

There is an excellent (colored) plate of a full plant in Hooker's "Filices Exoticae," where it is figured (t. 45) as *Pteropsis lanceolata*, Desv., and of a single frond in Lowe's "Exotic Ferns" (Vol. 2, pl. lxiv), and "Les Fougères" (p. 33, pl. 9), under the name "*Nevrodium lanceolatum*, Fée.',

For the benefit of those who may not have access to the authorities quoted, I give the following brief description of Mr. Curtiss's specimens: Rootstock creeping; stipes 1 to 2 inches long; laminae 8 to 13 inches long, $\frac{1}{2}$ to $\frac{3}{4}$ of an inch broad, tapering both ways, entire, or slightly sinuose at the margins, midnerve prominent; veins immersed, anastomosing, the exterior free, and, as well as the free veinlets within the hexagonal areoles, clubbed at their apices; fructification ante-marginal, in a continuous line near the apex.

Habitat.—Old Rhodes Key, Florida, on soft-barked trees. Discovered by A. H. Curtiss, May, 1881. Heretofore collected in St. Domingo, Jamaica, Martinique, Guadaloupe, Cuba, and not uncommon in the West Indies generally.

Mr. Curtiss's specimens are somewhat narrower than the published plates and descriptions call for, but some of Chas. Wright's Cuban specimens are quite as narrow.

Mr. Curtiss having placed in my hands all of his duplicate specimens, they will be distributed among the more prominent herbaria as far as their limited number will go.

CHEILANTHES TOMENTOSA, Link.—Mr. C. G. Pringle sends specimens of this rare fern from the Santa Catalina and Santa Rita Mountains, Arizona, and reports *Aspidium patens* and *Woodwardia radicans* from the same region.

PELLAEA GRACILIS, Hook.—Shortly after reading Mr. Rusby's interesting notes on the New Mexican ferns in the *Botanical Gazette*, in which he describes the bifurcations of *Woodsia Oregana* (var. ?), I had occasion to look over my duplicates in order to select a few specimens for a correspondent; when, almost the first thing that met my eye was a double-fronded specimen of this delicate fern (*P. gracilis*). The stipe had forked near the top into two short divisions, each bearing a perfectly-developed, fertile lamina.

Medford, Mass., July, 1881.

§ 84. New Species of North American Fungi.

By J. B. ELLIS.

VALSA TUBERCULOSA.—Perithecia 8—10, about .018′ diameter, subcircinating and buried in a stroma formed entirely of the substance of the bark, (the latter not being discolored, though rendered more compact) and surrounded by a black circumscribing line, which is very distinct and penetrates the wood beneath; ostiola short-cylindrical, thick, stout, obtuse, with an irregular opening; asci broad-lanceolate, sessile, .003′x.0006′; sporidia biseriate, oblong-elliptical, hyaline, uniseptate and slightly constricted at the septum, .0005′x .0003′, with two large transparent nuclei, at length separating in the middle.

The bark of the limb finally decays and falls away, leaving the tuberculiform stroma adherent to the surface of the wood.

On dead limbs of *Amelanchier Canadensis*. April.

Lophiostoma tingens.—Perithecia buried in the wood, mostly compressed, thick and leathery and of medium size; ostiolum barely visible on the surface, not projecting and only slightly compressed; asci cylindrical, .0035′x.0004′; paraphyses linear; sporidia uniseriate, oblong, obtuse, brownish, 3-septate, with a longitudinal septum more or less distinct, often slightly curved, variable in length, mostly about .0007′x.000275′.

On dry, decorticated maple limbs. February.

Sphaeria funicola.—Scattered, minute, ovate-globose, seated among the fibres of cotton; ostiolum not prominent; asci turgid-cylindrical, .0025′x.0007′; paraphyses connate and brown above; sporidia biseriate, oblong-elliptic, hyaline, 3-septate, slightly curved, .00075′—.0008′x.0003′.

On old cotton twine, exposed on a grape trellis. Iona, N. J. January. Rev. Isaac Leonard.

Sphaeria latebrosa.—Perithecia minute, gregarious, sub-globose, covered by the epidermis, which is elevated and blackened above and soon pierced by the subconic ostiola; asci clavate-cylindric, about .0035′ long; paraphyses filiform, abundant, interwoven, longer than the asci; sporidia biseriate, fusiform, slightly curved, 4–6-nucleate, about .001′ long.

On basal sheaths of old *Andropogon*. September.

Sphaeria (Diaporthe) gallophila.—Densely gregarious, perithecia sub-cuticular, depressed-hemispheric, .0009′—.001′ diameter, rugose; ostiola cylindric, obtuse, minutely roughened, .0006′—.001′ long; sporidia biseriate, oblong-fusiform, hyaline, 2–4-nucleate, and mostly constricted, when young faintly appendiculate at each end, slightly curved, variable in length, .0005′—.0007′ long.

The part of the matrix occupied by the fungus appears to the naked eye as if covered with a black pubescence, so thickly is it dotted with the hair-like ostiola.

On dead canes of *Rubus villosus*. September.

Sphaeria (Leptos.) defodiens.—Perithecia depressed-globose, .0085′—.01′ diameter, covered with fragments of the ruptured epidermis, at length deciduous; ostiolum subglobose, large, prominent; asci broad, clavate-cylindric; paraphyses abundant; sporidia biseriate, fusiform-oblong, hyaline, 3–5-septate and at length constricted at the septa, .0008′—.0012′x.0002′—.0003′, with an apical bristle-like appendage when young.

On *Juncus*. Iona, N. J. September.

Sphaeria (Leptos.) Mertensiae.—Subcuticular; ostiola papilliform; asci clavate-cylindric, .003′—.004′x.0006′—.0007′; sporidia crowded, linear-lanceolate, yellowish, nucleate, uniseptate at first, becoming at length 5- (or more) septate, constricted near the middle and more or less swollen, .00015′—.02′x.00015′—.0002′.

Nearly allied to *S. Ogilviensis*, B. & Br., but the sporidia are larger and the perithecia not flattened nor collapsed.

On dead leaves of *Mertensia*. American Fork Canyon, Utah. M. E. Jones. July, 1880.

Sphaeria (Leptos.) leiostega.—Perithecia gregarious, pustuliform and entirely covered by the cuticle, which is scarcely blackened above them; asci cylindrical; sporidia uniseriate, elliptical, nearly hyaline, 3-septate, .0008′x.00035′—.0004′.

Allied to *S. fuscella*, B. & Br.

On various dead twigs—*Carya*, *Rosa*, *Vaccinium*, etc.

Sphaeria Eckfeldtii.—Minute, scattered, erumpent, pustuliform, membranaceous, black, at length pierced; asci bag-like, obovate, about .0025′x.001′; sporidia inordinate, oblong, sub-hyaline or fuscous at first, soon becoming brown and 3-septate, .0013′x.0003′.

On bleached wood of *Castanea*, near Philadelphia. January. J. W. Eckfeldt, M.D. (Ellis, *N. A. Fungi*, No. 593.)

Meliola maculosa.—Forming patches 1-4th inch across, on the under side of the leaf. Perithecia subglobose, perforated above, seated on a mycelium of brown, branching, sparingly-septate, prostrate threads, and surrounded at the base with a few straight black spreading hairs, about equal in length to the diameter of the perithecium; asci sessile, cylindric, .002′x.0004′; sporidia irregularly uniseriate, subhyaline, elliptical or ovate-elliptical, .0004′—.00045′x .0002′, uniseptate and constricted at the septum.

On fallen leaves of *Andromeda*(?). June. (*Venturia maculosa*, *N. A. Fungi*, No. 200.)

Asterina nigerrima.—Perithecia flattened, minute, .003′—.004′ diameter, of a radiate, cellular structure; asci oblong-clavate, sessile, .0013′x.0004′; sporidia crowded, oblong-clavate, slightly curved, nearly hyaline, 4-nucleate, .00045′—.00015′; paraphyses none.

The portion of the stem occupied by the fungus is blackened as if charred.

On old stems of *Erigeron*(?), lying on the ground. October.*

§ 85. **Helonias bullata,** L., **in Morris Co., N. J.**—A reliable report that this plant had been gathered by a lady, in a bog near the town of Dover, induced me to hunt for it. My informant, Rev. E. E. Butler, formerly rector of the Episcopal church of that place, and familiar with the vicinage, kindly offered to go with me and act as guide. On the 12th of May we went from Easton to Dover by rail, and drove thence four miles westward, to the village of Succasunna, which lies on a plain of the same name between the mountains, at an elevation of about 600 feet above tide. Passing along its single street from south to north, we stopped at the last house, tied our horse to a tree and followed the road on foot toward an extensive wooded swamp, which it crossed, a little distance beyond. Not a hundred yards from the house, I spied in a fence-corner a leafless shrub bearing one opened bunch of rose-colored blossoms. To my surprise it proved to be *Rhododendron Rhodora*, Don. Further search brought us two additional specimens, for it had barely begun to bloom. A week later, the bushes were, no doubt, in their full glory. The portion of the swamp on the left side of the road was first visited. On the damp, shaded ground flourished profusely *Anemone nemorosa*, *Coptis trifolia*, *Polygala paucifolia*, *Aralia trifolia* and *Smilacina bifolia*, but no sign of what we sought could be detected. We then returned to the edge of the swamp, and tried it on the right, or east side of the road. Good fortune favored us, and in less than five minutes we stood in the midst of an acre of *Helonias bullata*. It grows underneath larch-trees (*Larix Americana*, Mx.) in soft, black muck, and its chief associates are *Clintonia borealis* and *Sarracenia purpurea*. Here and there appeared a stout scape, about 2 feet high, capped with its short spike of purplish flowers, and at its base clustered the broadly ovate new leaves beside the oblanceolate and very elongated old ones of last year. Such results from the exploration of a limited area during the brief space of an hour indicate that other interesting species await discovery in that swamp. Mr. Butler, who is a good amateur botanist, also informs me that in the same region there are several other bogs and swamps rich in floral treasures, in one of which *Calla palustris* abounds. On our way back to Dover we observed a hillside covered with a fine growth of *Juniperus communis*.

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* In the present and foregoing articles, where no locality is given the species were collected in the vicinity of Newfield, N, J.

Easton, Pa. THOMAS C. PORTER.

§ 86. **Cross-Fertilization in Cereus phoeniceus.**—While collecting specimens of the above species in the Burro Mountains, N. M., I noticed a great difference in the flowers on two adjacent plants. In one form the styles were exsert, and the stamens shorter than the petals, while in the other the styles and petals were of about equal length. Naturally, I at first thought this a case of dimorphism, but the following observations convinced me of my error. The long-styled form had broadly spatulate petals of a very bright scarlet-red color, while in the other the petals were narrowly spatulate, and of a darker purplish-red, thus indicating a difference of variety. Although the stigma is not exsert in both forms, yet by the contraction of the withering corolla it shortly becomes so, the corolla dried tightly around the style preventing all access of the pollen to its own stigmas, which up to this time remain tightly closed and probably impotent. The latter fact could not be certainly determined, owing to a lack of material. The plant is very scarce in this immediate vicinity, and when I again visited these few plants no flowers remained. But I have no doubt that such is the case; for up to the time of the inclusion of the anthers (should any pollen remain), the stigmas are not only tightly closed, but hard, dry, and green, and in no case could any pollen be found upon them. The stamens, moreover, before the closing of the corolla, become limp and collapsed. But after this period the stigmas open, and pollen in abundance may be found upon them. Now if, as apparent, this is an arrangement for cross-fertilization, which is equally effected in both the long and short-styled forms, dimorphism is needless.

The only insects found visiting the plants were two species of ants, and a very small but active grasshopper. Not only is there a drop of the richest and sweetest nectar at the base of the style, but the cells of the entire flower are saturated with saccharine material. The flowers are frequently found with stamens, style, and a large portion of the corolla eaten away. The actions of the grasshopper are noteworthy. From his position in the heart of a flower he will leap lightly up through the anthers above him, and alight, possibly in or upon another flower, but more frequently upon a spine of the plant, which he will neatly grasp, preventing himself from being impaled. In this way the pollen is unavoidably scattered. I was unable to catch one of the active little creatures, so I cannot say what appendages or arrangements he may have for conveying the pollen about his person.

In conclusion, I would remark that a large plant, consisting of many heads or stems, grew in the dooryard of a house where I spent some time. While the plant was blooming I watched it closely for the appearance of insects, but could never see any upon it. It produced no fruit, nor, as I was informed, has it done so during the years that it has grown and bloomed there; a fact which may, or may not be significant.

Silver City, New Mexico. HENRY H. RUSBY.

§ 87. **Fasciation.**—Instances of this deformity appear to be very frequent this season. I have lately had sent me from this neighborhood a specimen of *Leucanthemum vulgare*, Lam., in which two heads were united at the summit of the flattened stem. Now, I have a remarkable specimen of *Rudbeckia hirta*, L., in which four heads are so united, forming a rosette of considerable beauty.

Brown University, July 13th, 1881. W. WHITMAN BAILEY.

§ 88. **Botrychium simplex** was found near Salem, Mass., by J. H. Sears, June 26th. The specimens were first rate, and four were found with *B. lanceolatum*, *B. matricariaefolium* and *B. Virginianum.*

Salem, Mass. JOHN ROBINSON.

§ 89. **Plant Exchanges.**—ERICACEAE WANTED.—I am anxious to obtain flowers and buds, in all stages of development, of the rarer and less accessible species of the *Ericaceae*, and will be glad to exchange for them species of plants from New Mexico.

Silver City, New Mexico. H. H. RUSBY.

FOR EXCHANGE.—I have found within the limits of this city, *Carex tetanica*, Schk., *C. Muhlenbergii*, var. *enervis*, Boott, very distinct; also the genuine *Eragrostis pilosa*, Beauv., and *E. Purshii*, Schrad. The latter, as I understand it, also according to Dr. Geo. Vasey, has often been regarded by many collectors as *E. pilosa*, though it is very different. I will send any or all of the above to any one for my desiderata.

Yonkers, N. Y. E. C. HOWE.

FOR EXCHANGE.—I have for exchange, *Petalostemon foliosus*, which grows abundantly in this neighborhood in a single locality—the only one that I know of in Illinois.

Astragalus Plattensis, var. *Tennesseensis*, is also common here.
Ottawa, Ill. H. L. BOLTWOOD.

§ 90. **Florida Ferns.**—Mr. A. H. Curtiss, Jacksonville, Fla., has sent us a set of his second fascicle of Southern Ferns. The specimens have the perfection for which Mr. Curtiss's preparations are famous, and, as will be seen by the following enumeration, are of particular interest: 1. *Pteris longifolia*, L.; 2. *P. Cretica*, L.; 3. *P. aquilina*, var. *caudata*, the specimen consisting of lowest divisions of lowest branches of plants 6–8 feet high; 4. *P. serrulata*, L, f., from the grounds of Charleston College; 5. *Adiantum Capillus-Veneris*, L.; 6. *Asplenium dentatum*, L.; 7. *A. firmum*, Kunze; 8. *A. parvulum*, Mart. & Gale.; 9. *A. myriophyllum*, Presl; 10. The unheralded *Aspidium trifoliatum*, Swz., from Western Florida; and, 11. *Aneimia adiantifolia*, Swz.

The price of the set, post paid, is $1.50, 25 cents off for extra copies in one package. Mr. Curtiss also offers a second series of his first fascicle, minus *Ceratopteris*, nearly all from different localities, for $1.25.

§ 91. **Botanical Literature.**—*The Marine Algae of New England and Adjacent Coast.* By W. G. Farlow, M.D. (Reprinted from Report of U. S. Fish Commission) 8vo, pp. 210, with 15 plates. Washington, 1881.—This long needed addition to our cryptogamic literature, although originally presented as a "report," is in reality a manual, which, in a compact and more or less popular form, gives descriptions of the different orders and species of sea-weeds (exclusive of the Diatoms) found on our coast between Eastport, Me., and the State of New Jersey; and, by means of which, any person visiting the seashore within the limits just named can readily determine any of the forms that may be found. To facilitate the work of determination, and to enable amateurs who are little or not at all acquainted with our sea-weeds to ascertain with some degree of accuracy the genera to which the collected specimens are to be referred, an artificial key to genera is appended to the descriptive portion of the text. Following the introduction, which gives a résumé of the literature relating to American marine algae and an account of the distribution of our species, there is a short but comprehensive sketch of the general structure and classification of sea-weeds, which will prove of special value to the student, inasmuch as there is no generally accessible book in the English language which gives a good account of the modern views of classification and structure of these cryptogams. This portion of the work concludes with full directions for collecting and preparing sea-weeds, and then follow the descriptions of the orders, genera and species. The descriptions of the species are exceedingly perspicuous, and, in framing them, it has evidently been the author's intention, by avoiding technicality, to make his work as valuable to the amateur collector as to the scientifice botanist.

No one who contemplates visiting the coast for the purpose of collecting marine algae can well afford to go unprovided with this work, which, we are informed, has been placed on sale at Mr. Geo. A. Bates's Naturalists' Bureau, Salem. Mass.

Uj Vagy Kevesbbé Ismert Szömörcsögfélék. Phalloidei novi vel minus cogniti. By C. Kalchbrenner. (From the Memoirs of the Hungarian Academy of Sciences) 8vo, pp. 23, with 3 colored plates. Budapest, 1880.—The immediate object which the author had in view in the preparation of this memoir was to bring to the attention of botanists several interesting species of the *Phalloidei* which had been sent him and which proved to be new to science; but, in giving descriptions and colored figures of these, he has also taken occasion to propose a somewhat modified grouping of the known genera into families, and to give a list of such genera and species as were either overlooked by Schlechtendal or have been detected and described since the appearance of the latter's monograph* of the order in 1861. Mr. Kalchbrenner first divides the order into two sections: (1) EXOSPORI, including species in which the sporiferous mass is seated on a pileus discrete from the stipe (*Mitrati*), or on a pileus confluent with the stipe (*Capitati*); and (2) ENDOSPORI, comprehending species whose stipe divides into simple or anastomosing laciniae, which are always joined at the apex (*Conjugati*), or into free and radiating laciniae (*Liberati*). This arrangement gives rise to four families: I. *Exospori mitrati=Phallei*, Fr.; II. *Exospori capitati=Corynitei*, Kalchbr.; III. *Endospori conjugati=Clathrei*, Fr.; IV. *Endospori liberati=Lysurei*, Fr. The author remarks that the "Father of Mycology, E. Fries, and those authors who follow him, have adopted but three families of the *Phalloidei*, but to these I have thought a fourth should be added for the reception of *Symblum* (*sic*) and of those cognate species which have been more recently described."

Since the time of Fries's arrangement of the *Phalloidei*, several new genera and many new species have been described, and, while this may possibly necessitate a still further division of the order, it is unfortunate that Mr. Kalchbrenner, in attempting to supply such a want, should have grouped together in his new family (*Corynitei*) so incongruous genera as *Corynites*, B. & C., *Simblum*, Klotzsch, *Foetidaria*, St. Hil., and *Kalchbrennera*, Berk. We have already, in a former note,† suggested that the genus *Corynites* has very weak claims to be regarded as generically distinct from *Cynophallus*; the two alleged characters upon which it is founded are not at all constant, and, even supposing that they were, one of them—the perforation at the apex—is trivial at the best. At all events, *Corynites* belongs to the family *Phallei*. Placing the genus *Simblum* (or *Symblum*,‡ as the author invariably spells it) and the unknown, although apparently closely allied genus *Foetidaria*,‖ in the same family with *Corynites* was a very bad mistake; for, in the first place, *Simblum* is endosporous, and, in the second, it can only be regarded as a stipitate *Ileodictyon*, and hence must be relegated to the family *Clathrei*. The genus *Kalchbrennera* is somewhat anomalous and appears to have little affinity with any of the genera belonging to the three Friesian families of the *Phalloidei*. Messrs. Welwitsch and Currey, who described the first species known, referred it the genus *Lysurus*, but an inspection of the figure given by them, and of the beautiful colored one given by Mr. Kalchbrenner, shows that those authors were undoubtedly mistaken. If a fourth family of the order is to be formed, the genus *Kalchbrennera* is the one, and the only one, to constitute it until the discovery of other forms which are allied to it.

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* *Linnaea*, Vol. xv. † This Journal, Vol. vii, p. 30.

‡ Nomen ab σιμβλον, *favus*.—Klotzsch in Hook. Bot. Misc. ii, p. 164.

‖ No specimen nor drawing to illustrate this genus proposed by St. Hilaire was preserved, and the sole species, *coccinea*, is known only from a description in the *Annales des Sciences Naturelles* (2 ser., viii, p. 263). The genus is clearly the same as *Simblum*. St. Hilaire's description of the capitulum—"composé d'un reseau double, à mailles inegales, et qui semble formé d'une espèce de cordonnet," etc., seems to have puzzled botanists. Schlechtendal thinks that the expression *reseau double* means a double network, or, in other words, one network within another, but it is probable that the author refers to the doubling laterally of the branches which compose the network. An example of this structure may be seen in the capitulum of *Simblum rubescens*, in Pl. I, Vol. vii of the BULLETIN.

In concluding a list of such genera and species as do not occur in Schlechtendal's monograph, the author remarks: "As far as I have been able to ascertain from the sources at my command, there are 60 species of *Phalloidei* known," although he regards it probable that a few more species may have been described in periodicals to which he has not had access. The list includes the name of 15 species; but, further on, among the forms credited to Australia, there occurs the name of still another, which was omitted by Schlechtendal. To these sixteen species, we may add the following, which Mr. Kalchbrenner has overlooked: *Phallus phalloideus*, Berk. (Java); *P. truncatus*, Berk. (India); *Hymenophallus roseus*, De Ces. (Borneo); *Cynophallus bambusinus*, Zolling. (Java); *Corynites elegans*, Mont. (Colombo); *Clathrus delicatus*, B. & Br. (Ceylon); *Laternea pusilla*, B. & C. (Cuba); and *Lysurus Archeri*, Berk. (Tasmania).

In the geographical distribution of the order we notice that *Colus hirudinosus*, Cav. & Sech., is assigned to South America; it was, however, detected by its authors in the vicinity of Toulon, France.

The new species, beautifully figured in colors, in the three plates accompanying Mr. Kalchbrenner's paper are: *Kalchbrennera Tuckii*, Berk.; *Anthurus Woodii*, MacOw.; *A. Muellerianus*, Kalchbr.; *Cynophallus papuasius*, Kalchbr.; and a new variety (var. *discolor*) of *Dictyophallus aurantiacus*, Mont. If the section of the *Cynophallus* is correctly given the plant can scarcely be referred to that genus.

Grevillea, for June, contains: 'New British Fungi,' by M. C. Cooke; 'Fungi on Eucalyptus,' by M. C. Cooke and H. W. Harkness; 'Fungi Macowaniani,' by Rev. C. Kalchbrenner; 'Australian Fungi,' by M. C. Cooke; and 'Mimicry in Fungi,' by M. C. Cooke.

In the *Botanical Gazette*, for July, Dr. Rothrock has an article on 'Home and Foreign methods of Teaching Botany'; Dr. Engelmann describes some new species of North American Plants; Mr. C. H. Peck describes some new species of Fungi; Prof. W. W. Bailey records a case of doubling in the flowers of *Epigaea repens*; and several other correspondents communicate notes of interest.

In *Hedwigia*, for May, Dr. George Winter has some 'Notices of a few Discomycetes.' The June and July numbers have as yet failed to reach us. Dr. Winter, the editor, informs us that his address, from August, 1881 to April, 1882, will be Emilienstrasse, 18, Leipzig, Saxony, whither he goes to continue the *Exsiccati* of the late Dr. Rabenhorst.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VIII.] New York, September, 1881. **[No. 9.**

§ 92. New Species of Plants, chiefly New Mexican.

By EDWARD LEE GREENE.

ASTRAGALUS GILENSIS.—*Argophylli*; perennial; subcaulescent, white-silky with a fine, closely-appressed pubescence; peduncles numerous, slender, scape-like, bearing a short, dense, subcapitate raceme; corolla 3 lines long, pale blue; pod 3 lines long, coriaceous, silky-pubescent, ovate, not obcompressed nor either suture at all impressed.

On a high summit at the mouth of the canyon of the Gila River, in New Mexico. April, 1881.

Plant with the habit of *A. Missouriensis*, but very much smaller every way, and very distinct by characters of flower and fruit.

ASTRAGALUS MOGOLLONICUS.—*Mollissimi*; perennial, nearly stemless, densely clothed with yellowish, woolly pubescence; peduncles short, scape-like; racemes dense, subcapitate: flowers large, greenish-yellow and purple; pod 4 lines long, nearly cylindrical, completely 2-celled, hardly at all incurved, very densely white-woolly.

Bleak, grassy summits of the middle elevations of the Mogollon Mountains in New Mexico, flowering in April, 1881.

As compared with its nearest ally, *A. Bigelovii*, the plant is a dwarf, being barely a span high Its still smaller pods are much more densely woolly, and nearly straight in maturity, in which latter character, however, the species is at variance with the rest of the *Mollissimi.*

POTENTILLA SUBVISCOSA.—Ascending, a span to nearly a foot high, clothed sparingly with straight, villous hairs, and with a denser coat of short, viscid-glandular ones; leaves digitate; leaflets 5, cuneate-oblong, ½—1 inch long, the margin with close, oblong, not very deep lobes; cyme very loose; pedicels slender, an inch long, deflexed after flowering; petals yellow, 4–5 lines long, nearly twice the length of the calyx-lobes, and narrow; carpels about 12.

On a dry southward slope of the Mogollon Mountains, flowering in April, 1881.

A well-marked species, peculiar in having two so distinct kinds of pubescence as to make it both soft and clammy to the touch. The narrowness of the petals is also quite remarkable, some of them appearing almost oblanceolate.

MEGARRHIZA GILENSIS.—Leaves deep green on both sides, not at all glaucous, somewhat scabrous above, smooth beneath, orbicular-cordate, the sinus mostly closed, 5–7-lobed almost to the base, the divisions not broader above, entire, or with a single pair of large teeth a little above the middle, each lobe and tooth tapering to an acute, or a slender point; fertile flowers with rudiments of stamens; fruiting pedicels slender, an inch or two long; fruit an inch in diameter, globose, with a rounded base and sharply beaked or pointed apex, clothed usually very densely with soft spines, some of which are straight, others hooked, 4-celled, 4-seeded; seeds somewhat flattened, broadly ovate or more or less irregularly orbicular, attached to the outer side of the cell near the base.

Growing in deep sand on the banks of the Upper Gila River and its tributaries, climbing high over willows, flowering in February and March.

Specimens collected several years since, at Willow Springs, Arizona, by Dr. Palmer, are, by Mr. Watson, identified with this. Mr. H. H. Rusby obtained the same in flower only in a canyon of the San Francisco River in the same Territory, a few miles above the confluence of that stream with the Gila; but the material whence this description is drawn, was obtained by the writer in March and April of this year, at a locality still further east, namely, the canyon of the Upper Gila in Grant County, New Mexico, within fifteen miles of the dividing ridge between the Pacific and Atlantic slopes of the continent. The species is most nearly related to *M. muricata*, Watson; but that has its leaves strongly glaucous beneath, with lobes widening above and showing a continuously-toothed margin, fertile flowers without abortive stamens, and with fruit which is nearly or quite smooth. Its globose, marginless seeds are also peculiar. Mature seeds of *M. Gilensis* have not, indeed, been seen, but in the fruits collected in April they were full grown and partially hardened, showing the flattened, irregularly-orbicular outline of those of *N. Marah*, Watson, between which and *M. muricata* this new species will have to be placed.

✓ SENECIO CARDAMINE.—Completely glabrous; radical leaves on slender petioles, cordate-orbicular or -ovate, the margin sinuate-denticulate, the under surface purple, the upper dark green and marked with conspicuous, whitish or purple veins, those of the stem remote and inconspicuous, from lyrate-pinnatifid to triangular-lanceolate, all with a broad clasping base; stems a span to a foot high; heads of middle size, solitary or 3–5 corymbosely arranged; involucre 3 lines long, scarcely calyculate; rays about 8, rather pale yellow.

On cold northward slopes of the higher Mogollon Mountains. April, 1881.

In the dried specimen the color of the rays has become almost gold-yellow, and the plant seems closely to resemble certain common states of *S. aureus*, L., a species which also abounds in the Mogollon Mountains, running into many variations. From all these, however, the living plant here characterized differs so strikingly in aspect that when I first saw it, showing the leaves only, I judged it to be some species of *Cardamine*, and was greatly surprised when, in flowering, it manifested itself a *Senecio*. The dark-colored, beautifully-veined leaves lie flat upon the ground, and have strongly the appearance of those of *Cardamine purpurea*, Torr. & Gray.

✓ SENECIO HOWELLII.—Less than a foot high, all the younger parts white with a dense close wool, much of which disappears with age; leaves rather long-petioled, the lowest ovate to oblong with margins sinuate-toothed, the upper oblong-lanceolate in outline, and irregularly-pinnatifid; heads few, large, in a terminal corymb; involucres 5 lines long, naked at base, scales broad and rather obtuse; rays 8–

10, oblong-linear, yellow; style-branches with a short sparse fringe around the base of the nearly truncate tip, which bears a stout, apparently deciduous, central bristle.

Collected on the upper Columbia River in Oregon, June, 1881, by T. J. Howell.

A most interesting ally of the rare *S. Greenei*, Gray. The remarkable central bristle of the style-tips is not found save in the young flowers, whence I infer it to be deciduous

POLYGONUM (AVICULARIA) PARRYI.—Annual, 2–3 inches high, diffusely branched, stems smooth and sharply angled; leaves ½–1 inch long, linear, acute, 1-nerved; bracts similar to the leaves; sheaths broad and rather large, parted half way down into a fringe of setiform, crisped lobes; flowers sessile, a line or less long; akenes chestnut-brown, very smooth and shining.

Yosemite Valley, California, June, 1881. Collected by Dr. C. C. Parry.

Near to *P. imbricatum*, Nutt, which it closely resembles; and, since the locality has been gleaned by nearly all the botanists who have collected in the State, it will not be strange if the species has been collected by others and referred to *P. imbricatum*. It is only under a lens that the excellent characters, found in the stipules and akenes, become apparent. Mr. Watson, however, assures me that nothing like this has before been received at Cambridge.

Berkeley, Cal., July, 1881.

§ 93. New or Little-Known Ferns of the United States. No. 10.

By D. C. EATON.

31. ASPIDIUM TRIFOLIATUM, Swartz.—This is another of Mr. A. H. Curtiss's interesting discoveries in Florida. He found it on a rocky hummock in Hernando County, in the middle of April last, and secured a sufficient stock for distribution in his Fascicle II of Florida Ferns. This species belongs to a different section of the genus from any other of our North American species of *Aspidium*. The section is named Euaspidium in Synopsis Filicum, and is characterized by the ferns composing it (only 7 or 8 in all) having ample foliaceous fronds or pinnae, with copiously-reticulated veinlets and the orbicular indusium of § Polystichum. Mr. Baker's diagnostic character of the species reads thus: "Stalks tufted, 1 foot or more long, brownish, scaly only at the base; fronds 12–18 inches long, 6–12 inches broad, with a large ovate-acuminate terminal pinna narrowed or forked at the base, and one or two lateral ones on each side, the lower mostly forked; texture papyraceo-herbaceous; primary veins distinct to the edge; areolae fine, copious, with free included veinlets; sori in rows near the main veins; involucres one line broad, orbicular, peltate." The range is from Florida, Mexico and Cuba throughout South America to Brazil and Peru. It is a common fern in those countries, and presents some diversities in the shape or cutting of the pinnae. The smaller specimens are three-lobed or trifoliate, whence the specific name, originally bestowed by Petiver and Linnaeus. Plumier called it "Hemionitis maxima trifolia," and gave a good account of it, and an acceptable figure in his classic work on American Ferns.

32. Pellaea andromedaefolia, var. pubescens.—More specimens of the fern called by this name in the Bulletin of January, 1881, have been received, including some from Saltillo, Mexico, collected by Dr. Edward Palmer. Mr. Davenport informs me that Mr. Baker refers this fern to *Pellaea cordata*, which it resembles about as much as it does *P. andromedaefolia*. For the present I must regard its position as doubtful. Dr. Palmer collected many interesting ferns last year, in Northern Mexico and in Western Texas. Among them are the long-lost *Pellaea aspera*, and the very scarce *Aneimia Mexicana*. He found *Notholaena Grayi* with both white and yellowish powder, and *N. sinuata* in a great variety of forms. I hope to have a full account of his ferns ready before very long.

33. Asplenium pinnatifidum, Nutt.—Writing of this little fern at page 63 of Ferns of N. America, Vol. I., I said: "I find one or two instances of a slight enlargement of the apex, as if there were an attempt to form a proliferous bud." I have now received a plant in which one of the fronds has produced a terminal bud, which has developed five little fronds. The plant came with the following letter from a venerable botanist to whom all fern lovers have long been under obligations.

Moulton, Ala., June 28, 1881.

My dear Sir:

I picked up on the 21st of June, the fern which you will find enclosed, *Asplenium pinnatifidum*, Nutt., which exhibits as clear an instance of growing from the tip of the frond as *Asplenium rhizophyllum* (or *Camptosorus rhizophyllus*). I have seen one specimen of like character before; and Mr. John F. Beaumont, now dead, advised me that he had found a like plant in South Alabama.

Very truly your friend,
Thomas M. Peters.

34. Botrychium matricariaefolium, Al. Braun.—Mr. and Mrs. Morgan found good specimens of this rare fern near Columbus, Ohio, June 10th, 1881. Professor Joseph Milliken was also associated with them in the discovery. This is the first record of this plant growing west of the Alleghanies and south of Lake Superior.

New Haven, August 12, 1881.

§ 94. **Vernation in Botrychia.**—I have had placed in my hands for examination two Botrychiums whose buds have thrown a doubt, for the first time in my experience, on the reliability of the bud-form as a test for the determination of the smaller species of the genus.

One of these specimens is a large, finely-developed, unquestionable specimen of *B. simplex* of the compositum form, and nearly ternate; the other is a specimen of *B. matricariaefolium* of good size, and with the sterile division cleft nearly into two portions.

The specimens were collected in the Lower Merrimac Valley, Essex Co., Mass., by Mr. W. P. Conant, who is thus entitled to the credit of adding another station to those already recorded for that once rare fern—and still rare in Massachusetts—*B. simplex*, Hitch.

The peculiarity about the buds of these two specimens is that in the specimen of *B. simplex*, contrary to all the examples heretofore examined, without any exception, the apex of the sterile division *is bent over the apex of the fertile division, in a manner approaching the bud of B. Lunaria*; and in that of *B. matricariaefolium* the apex is only slightly bent downward, scarcely more than occurs in the bud of *B. boreale*; the apex, however, is more acute than in *B. boreale*, and otherwise the bud has the characters of *B. matricariaefolium*.

Just what bearing these specimens may have upon my Vernation Notes (TORREY BULLETIN, Jan., 1878) and how far they may go toward invalidating the position therein taken, I am not prepared to say.

If we consider that the number of specimens which one may be able to examine, however great, may still bear a very small proportion to the total number of specimens in existence, it will be seen that if a deviation from an assumed type occurs even once in specimens examined it may occur many times in Nature.

As, however, this is purely conjectural, and we cannot know the actual number of specimens in existence, nor what proportion such deviations may bear to them, and as we can only base our rule of judgment upon such data as have actually come under our observation, and as it is not possible to establish any absolute rule—one that will not admit of some exception—an occasional deviation, such as this, does not seem to destroy the value of a character that is shown to prevail as a rule, and to be constant in the great majority of instances.

But I leave the discussion of inferences until such time as they can be more intelligently considered, and content myself with simply placing on record the above facts.

Medford, Mass. GEO. E. DAVENPORT.

§ 95. **Onoclea sensibilis,** L., var., **obtusilobata,** Torr.—Spending a portion of my summer vacation in Litchfield Co., Connecticut, I have made some observations among the ferns of this section which are found in abundance and profusion rarely equalled.

Camptosorus grows to some extent on the granitic rocks of this vicinity. I have never found it before except on highly calcareous rocks.

Ophioglossum vulgatum, L., is found in bogs, the sterile segment fully 3½ inches long.

"*Frondosa* forms" of *Osmunda cinnamomea*, L., occur, some with the fronds half sterile, half fertile, while *Osmunda regalis*, L., occasionally has the frond fertile in the middle!

The most interesting forms, however, were the variations of *Onoclea sensibilis*, L., which would have furnished ample constructive material for some of our more ardent variety manufacturers. In a low, rocky meadow near West Goshen the following graded series was found:

A. *Normal fertile fronds* with secondary rachises erect and appressed to the primary.

B. *Fertile fronds.* Segments all normally bead-like; secondary rachises spreading, regularly inclined to the primary about 35°.

C. *Fertile fronds.* Fully bipinnate; lower segments bead-like, the upper partially unrolled; secondary rachises spreading.

D. Var. *obtusilobata*, Torr. Pinnae pinnatifid throughout their whole extent; segments very strongly revolute, those nearest the base of the pinnae sometimes bead-like, as in normal fertile fronds; sporangia present in some of the indusia, even when the segments are only moderately revolute.

E. *Sterile fronds.* ½–⅓ the normal size; pinnae cut entirely to the midribs in their lower half; primary rachis wingless; margins moderately revolute; indusia present, conspicuous, 2–6 to each segment; sporangia none, or merely rudimentary.

F. *Sterile fronds.* Form similar to "E" but with pinnae less deeply cut and with mere traces of indusia on the basal segments.

G. *Sterile fronds.* Size and outline normal; primary rachis only slightly winged; margins slightly revolute.

H. *Normal sterile fronds* with primary rachis broadly winged, except between the lowest pairs of pinnae.

It will thus be seen that there may occur all possible forms intermediate between the sterile and fertile fronds, and that Dr. Torrey's var. *obtusilobata* is on the boundary line between the two.

In the present instance the *cause* of this variation seemed very apparent. The meadow in which these forms were found was cut late in June, before the fertile fronds were grown, thus destroying the earlier-formed sterile fronds. The vitality of the plant thus finding no outlet save through the growing fertile fronds, and the plant requiring an expanse of foliage, a result was reached intermediate between the fertile and sterile fronds. The following facts may serve to substantiate this view:

1. Wherever the sterile fronds had been entirely cut away, the variations appeared which approximated most closely to the sterile fronds.

2. Where the sterile fronds were only partly destroyed on one rhizoma, variations appeared not very divergent from the normal fertile fronds.

3. Where the sterile fronds remained intact, no variations were found, even after diligent search.

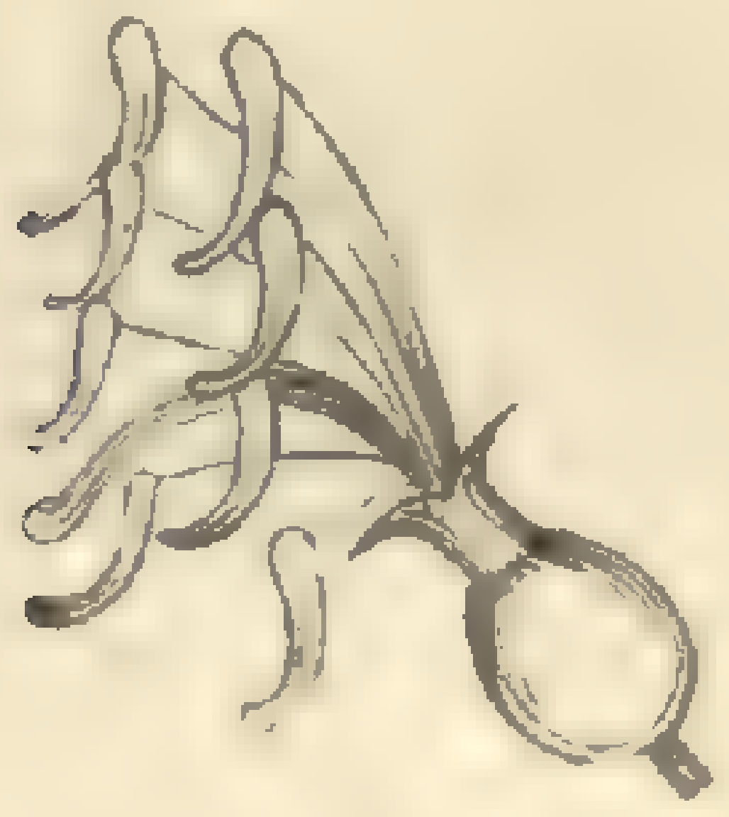
4. In places where the plants were too much reduced to bear fertile fronds under favorable conditions, no variations occurred, even when the sterile fronds were entirely cut away.

Whether the above explanation will prove satisfactory for all forms of the so-called var. *obtusilobata* wherever found, remains an open question; as a true variety, however, *obtusilobata* has no place, and it would be well if many more of other numerous forms that have been raised to the dignity of *varieties* could be consigned to a grave so secure.

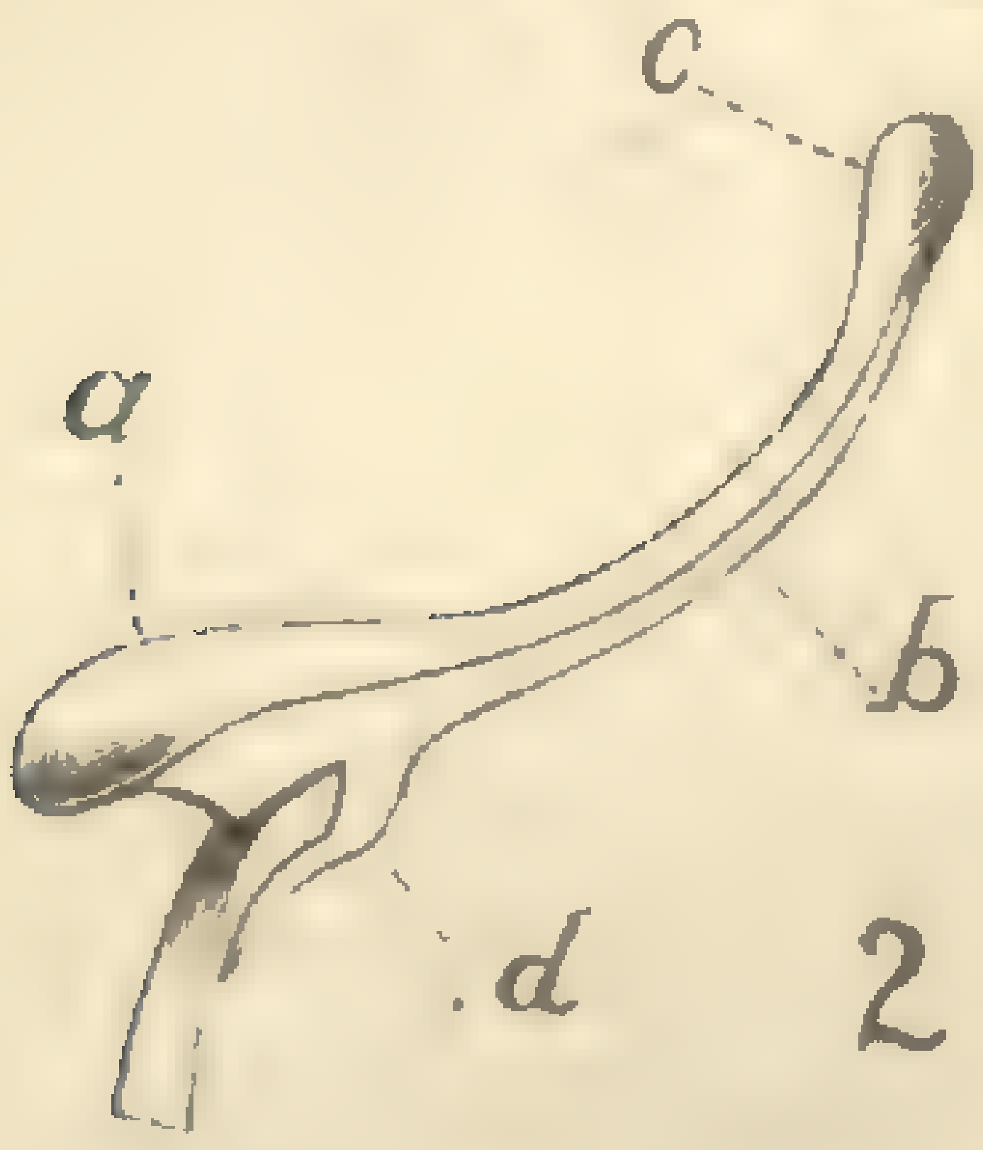
West Goshen, Conn. LUCIEN M. UNDERWOOD.

§ 96. **Fertilization of Rhexia Virginica**, L.—I have often wondered how ever the pollen escapes from such anthers as those of *Rhexia* and *Cassia*, indehiscent, with small and, in the present case, almost invisible pores. Nuttall seems to have felt the same difficulty; for, as quoted by Prof. Goodale, in "Wild Flowers of America," he thinks that the pollen of *Rhexia* escapes by a clandestine opening, protected by a seta near where the filament unites with the connective. I have not the book at hand to quote the precise words, but the fact that Prof. Goodale, who is well aware of the pore at the top of the anther-cell, quotes Nuttall's explanation, seems to imply that he himself was not satisfied as to the capacity of the pore to provide escape for the pollen. Insects are so clever in getting at the floral reservoirs in spite of the contrivances of Nature, that Nuttall may have been misled by some of their operations; but, as we shall see, there is abundant means for the escape of the pollen in the regular way.

If we open the bud of a *Rhexia* just about to expand, we find the pistil rising considerably above the circle of 8 stamens which surround it, but with the lobes of the stigma yet unseparated. In this stage the stamens are inflexed, so that the anther is enclosed between the filament and the style, the back of the connective resting on the style and the poliniferous tube confined between the connective and the filament. The "seta," or small spur at the base of the connective, is pressed between the latter and the style. Evidently there is no room here for cleistogamy. But, when the flower expands, the stamens arrange themselves in two sets, four on each side of the style, as shown in the side view, Fig. 1. Each anther stands atip on the top of its filament, so that, while the vertex is turned toward the lower part of the flower, it is nevertheless much more elevated above the floral plane than the puffed-out lower portion.



1



2

The poliniferous portion of the anther, Fig. 2, consists of a single sack, which may be described as consisting of three parts: an inflated lower portion (*a*); a narrow tube; and a very small oblate spheroid (*c*), flattened parallel to the upper surface of the anther, and, of course, having its axis perpendicular to that surface. The upper pole of this tiny spheroid contains a pore, so small as to be hardly discernible to the naked eye. Owing to the curve of the anther this pore faces towards, but upwards from its base. Under the poliniferous sack is the connective (*b*), reaching from the top to near the lower end, where it is overlapped by the inflated portion. A very little above the base of the connective the filament is attached, and just above this again, the small spur-like process (*d*) issues from the connective and presses with its point the upper part of the filament, whose extreme top is bent slightly backward.

While the stamens have been attaining their position, the style elongates, bends downward and turns up its stigma, which thus becomes considerably below and behind the anthers. At the same time its lobes separate and the viscid stigmatic surface is exposed. In this position the stigma affords the first resting-place for a bee alighting on the flower, and must catch any pollen that may be adhering to its abdomen. As the bee advances upward toward the tube of the calyx, he treads upon the inflated sacks at the base of the anthers, which yield to the pressure and, acting like a bellows, force through the minute pore a jet of the minuter pollen directly upon the rear or side of the intruder, but directly away from the stigma. I have seen an humble-bee upon a flower, pressing with his feet on the bellows, but, of course, could not get near enough to see the play of the pollen. It may easily be seen, however, by touching the bellows with a blunt point, when a surprising quantity of pollen will be thrown upon the instrument. A sharp point, like that of a pin, would be apt to perforate and spoil the delicate bellows. When touched in this way, it will be noticed that simultaneously with the jet of pollen the anther springs forward as if to aid the expulsive force, and then immediately springs back. In fact, my first impression was that it was this jerk which discharged the pollen. It is easily accounted for by the disposition of the parts as I have described them. The spur of the connective seems to act as a buttress to keep the anther in its tilted position.

It is evident that here is a very perfect contrivance for securing cross-fertilization, at least to a considerable extent. Though each plant of *Rhexia* produces a number of flowers, yet only one or two are usually in bloom at the same time, and these probably in different stages of advancement. The petals, which are the signals inviting insects, last but for a day or perhaps even a shorter time.

There are other points in the structure of *Rhexia*; the glandular hairs on the petals as well as other parts of the plant; the wing-angled stems, etc., which would repay study, if one had the plants accessible. For some of these observations I am indebted to my associate, Mr. Gerard.

In the case of *Cassia Marilandica*, I have watched an humble-bee hugging an anther, and apparently, so to speak, milking out the pollen.

W. H. L.

§ 97. **The Herbaria and Botanical Libraries of the United States. VIII.**—The HERBARIUM OF CORNELL UNIVERSITY numbers not far from 18,000 species. The larger part of the collection is made up of the herbarium of the late Horace Mann, Jr., which was purchased by President White and presented to the University soon after its opening in 1868. This is a general collection, but is especially rich in Sandwich Island plants. The principal additions since made include the Brazilian plants collected by the officers and students of the University in their expedition to South America in 1870; the Western United States plants collected in connection with the Government surveys of the Western Territories; small collections, some of them European, donated from various sources; and a very nearly complete collection of the plants growing in Central New York, comprising especially the flora of Cayuga Lake Valley. A full set of the latter, numbering about 1,300 species of phaenogamia and vascular cryptogamia, and known as the "local herbarium," is kept separate from the main collection for the convenience of students making a somewhat careful study of the whole or of some group of the local flora. There is also a nearly complete set of N. A. Atlantic coast sea-weeds, and above a thousand species of fungi.

In addition, the University has a somewhat extensive collection of woods, fruits, seeds, fibres, and various commercial, medicinal and economic vegetable products.

Ithaca, N. Y. A. N. PRENTISS.

§ 98. **Aspidium Lonchitis,** Sw., **in Colorado.**—Mr. T. S. Brandegee has recently found this fern in a damp sand-stone canyon in the Elk Mountains of Colorado, at an elevation of 9,800 feet. Dr. Parry and others had previously collected it in Utah, but we are not aware that it has been seen in Colorado till now. *Aspidium Filix-mas* and *Pellaea gracilis*, already known to the Colorado flora, also exist near the same locality.

Philadelphia, Pa. J. H. R.

§ 99. **The Popular Names of Plants.**—Dr. Gray, in a notice, last year, of the third edition of Dr. Prior's interesting work "On the Popular Names of British Plants," remarked: "What we here need is a supplement to Dr. Prior's volume, recording the changes which have occurred in the application of English popular names to North American plants, and giving the history and application of our indigenous plant-names." It seems to us that there is no better time than the present to begin the collection of material for such a supplement. We have already gathered from various sources a large number of popular names by which our native plants are, and have been known; but there are one or two points on which we need information that can only be obtained by the kind co-operation of the readers of the BULLETIN. We should like to find out, for instance, to what extent the English names applied to our plants in botanical manuals are mere book-names, and to what extent, and *where* they are in use among those who have no knowledge of Botany. We wish to ascertain, too, where many of the popular names that we have collected are at present in use. We know of no other way to obtain such information than to ask our readers to aid us by collecting lists of the popular names by which our plants are known in their neighborhood and sending them to us from time to time when convenient. When sufficient material has been collected the BULLETIN will publish it. It would be of interest, too, to put on record the names by which our plants are known to the aborigines, and we should like information on that point also, with the etymology of the names wherever obtainable. A hearty response to a request like this made through the columns of the *Science Gossip*, a few years ago, has enabled Messrs. Britten and Holland to compile an exceedingly interesting "Dictionary of English Plant-Names,"* which has now reached its second part, ending with the letter O. It is hardly necessary to say that, to make them of value for our purposes, the popular names should be accompanied by their scientific equivalents.

W. R. G.

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* *A Dictionary of English Plant-Names.* By James Britten, F.L.S., and Robert Holland. Part I, 1878; Part II, 1879. London, Trübner & Co.

§ 100. **Botanical Literature.**—*Memoria botanica sobre el Embarbascar* ó sea la Pesca por Medio de Plantas Venenosas. Por A. Ernst. (Del Tomo I de los "Esbozos de Venezuela"). 8vo, pamph., pp. 16. Caracas, 1881. There has long existed among various peoples, civilized and otherwise, in all quarters of the globe, a method of catching fish by stupefying them—this result being attained by throwing into the water, plants, or parts of plants, which have been ascertained to possess a narcotizing effect upon these animals. This reprehensible practice, against which laws have been enacted in most civilized countries, is concisely expressed in the Spanish word *embarbascar*, which forms the title of an interesting botanical memoir in which Dr. Ernst has brought together all the facts that he has been able to gather on the subject.

The verb *embarbascar* is derived from the old Spanish word *Barbasco*, which in turn comes from the old Latin plant-name *Barbascum* which in modern times has been altered to *Verbascum*. It seems that several species of this genus of plants have long been used for this method of fishing, and that the seeds of one of them—*V. Thapsus*, the common mullein—were thus employed in Spain as long ago, at least, as the 14th century, when the practice was prohibited by a decree of Juan II. These poisonous properties of *Verbascum* seem not to have been known to Roman authors, or at least are not mentioned by them ; but, Aristotle, among the Greeks, refers in his History of Animals to a plant called πλομος as being poisonous to fishes, and states that it was employed in some places for fishing. It is interesting, from an etymological point of view, to know that this mode of fishing was expressed by the Greek verb πλόμιζω, which was thus used in the same sense that the Spanish employ *embarbascar*. The word πλομος has been rendered by translators as *Verbascum*, and probably correctly, since, according to Sibthorp (Flora Graeca), *V. sinuatum* and several other species are known in Modern Greece as πλόμος or φλομος. Dioscorides likewise mentions a plant, τιθύμαλος πλατυφυλλος, which, he states, will kill fish when it is triturated and thrown into water. This plant, which has been identified as *Euphorbia platyphylla*, L., is still used in Europe for fishing.

Coming down to modern times we find the number of plants used for this purpose to be quite extensive. The enumeration appended to Dr. Ernst's paper embraces the names of 60 species distributed among 17 orders ; but this list is by no means exhaustive, and might be largely increased by reference to works of African travel, and by an examination of Lindley's Vegetable Kingdom, wherein are given the names of a number of ichthyotoxic plants which are not found in the paper before us. One of the plants enumerated by the author, *Polygonum acre*, HBK., we should scarcely have suspected of producing narcotic effects upon any animal, but it is used, nevertheless, it seems, as a stupefacient of fishes in South America.

Dr. Ernst's paper, which, with him, we think is the first that has been written on this particular subject, forms a valuable addition to the literature of the economic uses of plants.

We acknowledge the receipt, also, from Dr. Ernst, of a copy of his work entitled

*Las Familias mas importantes del Reino Vegetal * * * que estan representadas en la Flora de Venezuela*, an octavo pamphlet of 80 pages containing diagnoses of all the orders and families of the plants of Venezuela, designed chiefly for the use of the author's botanical class in the Central University, but also adapted to the wants of those who desire to acquire a knowledge of the more essential facts relating to the flora of that country.

On the geographical Distribution of the indigenous Plants of Europe and the Northeast United States. By Joseph F. James. From the Journal of the Cincinnati Society of Natural History, April, 1881. Dr. Gray has made us acquainted with the relations of our Atlantic flora to that of Eastern Asia ; in this essay Mr. James discusses the forms common to Europe and North America. He confines himself, however, chiefly to those included in Gray's Manual. Of these, he mentions 360 identical species, and remarks that, if to these we add the closely related or representative species, we shall find that one-third of the indigenous species given in the Manual resemble European forms. He accounts for this result by their common origin in the land about the North Pole, and their southern migration at the glacial period. That some species reaching a high latitude in Europe are not found in America as far north by 20 degrees, he explains by the present climatic conditions.

Sea Mosses ; a Collector's Guide and an Introduction to the Study of Marine Algae. By A. B. Hervey, A.M. Boston : S. E. Cassino, 1881. A small octavo of 281 pages and 20 colored plates. This book makes no claim of adding anything to the scientific knowledge of Marine Algae ; but is rather intended to supply a want hitherto greatly felt in America ; the want of a book of moderate price which should tell in popular language just as much about our sea-weeds as collectors and amateurs generally would wish to know. To this end all the characters used in describing the genera and the species are such as may be seen with the unaided eye, or at least with a pocket-lens of very moderate power.

This mode of studying sea-weeds may not be very scientific, nor does it pretend to be thorough, but it certainly gives pleasure and satisfaction to many persons who would never have the skill nor the patience to make the microscopic examination necessary to accurate knowledge of these plants. A lady who can prepare pretty specimens of "pink-leaf," or of "chenille" may like to know that the one is *Grinnellia Americana*, and the other *Dasya elegans* ; and there is certainly no good reason why she should not be gratified.

The author of this little book has included the best known of the sea-weeds of California and Oregon, several of these being figured as well as many of the species of our Atlantic coast. These figures are taken from specimens in Mr. Hervey's collection, and most of them well represent the species intended. Mr. Hervey's account of some of the "great kelps" of the Pacific is very interesting.

With this book for an introduction, and Professor Farlow's Report for a thoroughly scientfic text-book, the student of sea-weeds, in New England certainly, is well provided with literature. What he wants next is a good microscope, and, I may add, untiring patience.—D. C. E.

Illustrations of British Fungi. By M. C. Cooke. 8vo. Williams & Norgate, London.—This very beautiful series of colored illustrations of Agarics, which has now reached Part III, is deserving of a more extended notice than we can give it at present, but we hope before long to refer to the subject again. As a large number of the species represented is common to our own country, the work, when completed, will prove fully as valuable to American as to English botanists, and we trust that it may be liberally supported by both.

In *Hedwigia*, for July, Prof. G. Von Niessl describes seven new species of Pyrenomycetes, and Dr. Rehm reviews Century V of Mr. J. B. Ellis's "North American Fungi."

The *Revue Mycologique*, for July, contains: 'Additions to the Mycological Flora of the Department of Saône-et-Loire,' by Messrs. Lucand and Gillot; 'Fungi Helvetici Novi,' by Dr. George Winter; 'Reliquiae Mycologicae Libertianae,' by Messrs. Roumeguère and Saccardo; and a large number of extracts from other journals.

§ 101. **Proceedings of the Torrey Club.**—The regular monthly meeting of the Club was held at the Herbarium, Columbia College, Tuesday evening, June 14th, the chair, in the absence of the presiding officers, being occupied by Mr. G. W. Wright. There were eighteen members and three visitors present.

The committee on field meetings reported on the meetings held at Cranford, N. J.; West Brighton, S. I.; Newton, N. J., and Fort Lee, N. J. Nothing worthy of note was found on any of these excursions.

Mr. Gerard read a communication from Mr. H. W. Ravenel on an abnormal habit of *Asclepias amplexicaulis*, Michx.

Specimens Exhibited—Mr. Britton showed specimens of *Clematis ochroleuca*, Ait., from Todt Hill, S. I., having three to five-lobed leaves, and also a specimen of *Pogonia verticillata*, Nutt., having an adventitious leaf on the stem, an inch or more below the whorl at the summit. Dr. Schöny exhibited specimens of *Geaster hygrometricus*, Fr., and remarked upon the hygrometric properties of the plant. Dried specimens of various species of *Cerastium* were shown and discussed. Mr. Britton distributed specimens of *Wolffia gladiata*, collected by the late C. F. Austin.

Judge Brown remarked upon the persistency of certain foreign plants which have been introduced into the vicinity of the city in ships' ballast.

Mr. Hollick stated that he had detected, this spring, at West New Brighton, a tricotyledonous seedling of *Fagus ferruginea*. The three cotyledons were of equal size and perfectly distinct, *i. e.*, no two were united by their margins, as in the case mentioned by Dr. Masters in his work on Teratology.

Messrs. Leggett, Brown and Gerard were appointed a committee to revise the constitution and bye-laws of the Club.

Messrs. Rudkin, Schrenk and Martin were appointed a committee with power to call meetings during the summer months, if deemed advisable.

One corresponding member was elected, and one name proposed for active membership.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VIII.] New York, October, 1881. **[No. 10.**

§ 102. **Onoclea sensibilis**, var. **obtusilobata.**

By GEO. E. DAVENPORT.

The notes on the variations in *Onoclea* by Prof. Underwood in the September number of the BULLETIN lead me to contribute some of my own observations toward supplying data for an explanation of the causes by which the *obtusilobata* form is produced.

I have collected this interesting form of the *Onoclea* so many times, under conditions that utterly precluded all possibility of the specimens being the result of interference with the free growth of the plants which bore them, that I have long been inclined to regard it as an outcome of some inherent tendency on the part of the normal(?) form of the species to break up into other forms, or as a *possible reversion to an older type.*

I have collected specimens late in the season, in open meadow lands, where its appearance subsequent to mowing time suggested a probable cause and effect, but, as I also collected it plentifully in situations where no scythe ever ventured, and where the plants were not only as well protected from accident as it is possible for plants in nature to be, but were otherwise perfectly developed—the sterile fronds being well grown—and in some cases bearing normally-developed fertile fronds as well as the variation, I was led to believe that the plants in the meadows might still have produced *obtusilobata* forms even if they had not been interfered with by the mowers.

I was further confirmed in this view by finding one season, near a rivulet, and on a stony patch *left unmown* at the edge of a meadow newly mown, some of the finest specimens of *obtusilobata* that I have ever collected. From one plant I obtained four specimens of *obtusilobata.*

This plant I marked, and, re-visiting it the following season, found that it had resumed its normal habit and produced fertile fronds of a normal character; *yet there had not been any change whatever in the conditions by which the plant was surrounded.* Now what caused this plant to deviate from its normal habit one season and return to it another under conditions apparently similar—so far as any ordinary observation could judge—in both seasons, and when there was no perceptible outside disturbance to interrupt or interfere in any way with its free growth?

I collected one season sixty specimens of *obtusilobata*, in various stages of development, in one locality from plants, some of which had been injured in various ways and some of which were well supplied with healthy sterile fronds; but the next season I was unable to find a single specimen of the variation there, although I searched carefully, and found plenty of plants injured as before, the locality being one that was exposed to all sorts of accidents.

During the seasons of 1873–74 I made a series of experiments for the purpose of ascertaining, if possible, how far injuries to plants might go toward producing the *obtusilobata* forms. These experiments were begun as early as May, and continued at intervals of a fortnight, up to the 1st of September. During that time some hundreds of plants (the species being everywhere excessively abundant, there was, of course, no danger of exterminating it) in widely different localities were mutilated in every conceivable manner, but no *obtusilobata* was obtained in any instance.

These experiments were continued during the next season with the same unfavorable result, and seemed to show that the variation was not due to any interference with the natural growth of the plants by injury, or mutilation of any kind, whether accidental or designed, and that some other explanation was to be looked for.

Within a month I have collected three specimens of *obtustilobata* on plants with well matured, uninjured sterile fronds, and the appearance of the plants indicated that they had not been disturbed since they first started to grow in the spring.

These observations appear to show that the variation is due to some cause within the plant, rather than to any outside influence, however much such influence may assist in developing an impulse already existing. Finding, as I have more than once done, two plants growing side by side under precisely the same conditions, one with mutilated and the other with perfect, sterile fronds, yet each producing this variation, what other explanation is there than the one found in that disposition to vary which is inherent in the very nature of all plants, and which is likely to manifest itself at any time whenever the right conditions are favorable for such manifestation.

Take the kindred examples of variation in *Osmunda.* The laws which govern the variations of *Onoclea* ought to prevail here as the variation is similar in kind in both genera; yet, in my own experience, I have never seen a plant with the *frondosa* forms that did not have a plentiful supply of good healthy sterile fronds, and could never discover any difference in the conditions by which the plants were surrounded in the seasons when they produced the variation and in those when they did not.

The fact seems to be that there exists in all plants a tendency toward variation that will manifest itself occasionally whether the plants are injured or not. That changed conditions will oftentimes assist this pre-existing tendency to develop itself is probable, as we know that plants are so affected, but they cannot be regarded as the real cause of these variations which occur quite as often, and, in my experience with the variation under consideration, oftener without such assistance.

Injuries to plants are more likely to produce monstrously aborted forms, and while it cannot be denied that Nature herself, in her efforts to create varieties, oftentimes produces unnaturally abortive monstrosities, yet her efforts are oftener, and as a rule, directed toward the production of improved forms. Now the *obtusilobata* form of *Onoclea* is not in any sense an abortion, but in its most perfect state is an interesting and elegant form. Whether it is to be considered as evidence of an effort on the part of the species to create a variety, or as evidence of *reversion* is an open question. If we accept the doctrine that Nature's efforts are constantly exerted in the direction of duality—a separation of sexes—then the latter theory is not improbable; but if we look upon *obtusilobata* as a sport—an effort on the part of one species to break up into other species through varietal transitions—then it is not impossible that it may yet become so firmly fixed in its habit as to demand recognition as a good variety, although its present status as such has long been determined adversely.

Medford, Mass., Sept., 1881.

§ 103. New or Little-Known Ferns of the United States. No. 11.

By D. C. EATON.

35. WOODSIA MEXICANA, Fée.—"Fronds lanceolate; pinnules (pinnae) sub-opposite, crenate, short-stalked, very obtuse, smooth; stalk and rachis smoothish; sori near the margin, broad, confluent; receptacle dot-like, scales four, laciniated, narrow, divided at the end into articulated hairs; sporangia nearly sessile; ring 18-jointed; spores oval." 7me Mém. p. 66, t. 26. f. 3.

This fern is not recognized in the Synopsis Filicum, and Fournier has referred it to *W. mollis*, which is a larger and much more rigid fern, and has the involucre at first sub-globose, and enclosing the sori. The true *W. Mexicana* has the involucre cleft almost to the base into 3 to 5 segments, and these divided half-way down or more into a few slender articulated filaments, much as in *W. Oregana*, but on the whole decidedly more conspicuous. The fronds vary from 3 to 8 inches long, and might easily pass for *W. obtusa*, but for the involucre. The segments of the frond are finely but rather deeply toothed, and the teeth end in delicate and semi-transparent tips which are ciliated in the young fronds. When the fronds are mature this ciliation mostly disappears, and the involucre is lost, and then it becomes difficult to distinguish the fronds from those of *W. Oregana* on one side, and *W. obtusa* on the other.

To *W. Mexicana* I refer Drs. Parry and Palmer's No. 1,000, from near San Luis Potosi, Mexico; Dr. Palmer's plants from Coahuila; Mr. George R. Vasey's (son of Dr. Vasey, of the Agricultural Department, Washington) from Organ Mts., New Mexico (just received); Rev. E. L. Greene's No. 430, from Pinos Altos Mts., and Mr. Rusby's New Mexican fern distributed as *W. Oregana*, var. To these I venture to add Mr. Charles Wright's No. 2,120, collected in New Mexico thirty years ago, and referred to *W. obtusa* in the Botany of the Mexican Boundary.

§ 104. **White-fruited Mitchella repens**, L.—I have received specimens of a white-berried form of this plant from Dr. Chas. Atwood of Moravia, Cayuga Co., New York. Dr. Atwood writes that it was abundant over a few square feet, and that no red berries were found within the area occupied by the plants with white ones. This variation has also been noticed at Canaan, Conn., and recorded in the BULLETIN. See Vol. iii, p. 43.

N. L. BRITTON.

§ 105. **Hieracium aurantiacum,** L.—This native of elevated regions in Central Europe, was noticed by Mr. G. M. Wilber, at New Dorp, Staten Island, in 1875, and by Mr. N. L. Britton near the same place in 1877, as recorded in the BULLETIN, Vol. vi, pp. 56, 178.

On the 26th of August, this year, I found this plant growing abundantly and wide-spread over a stony hillside pasture near the Parker Notch, about two miles north of Tannersville, in the Catskills of Greene Co., N. Y., at an elevation of about 2,500 feet. It seems likely to become a permanent resident, for its prolific runners enable it to increase with rapidity, and the farmers there are already complaining of it as a troublesome, bitter weed. At the above date the plants were just coming into flower, the scapes being only 3 to 6 inches in height. A week or two later would find them in full maturity and of the size of European specimens.*

Philadelphia, Sept. 6, 1881. JOHN H. REDFIELD.

§ 106. **Ilex opaca with entire Leaves.**—We take the liberty of publishing the following note from Dr. Mellichamp. We had not known before of the tendency of the American holly to produce its upper leaves without spines and sinuosities, although we find on reference to Withering's Botany that such a thing occasionally occurs in *Ilex Aquifolium*, the English holly. We remember reading in boyhood, in the *Penny Magazine*, a poem of Southey's, entitled "The Holly Tree," where this peculiarity is noted and thus pleasantly moralized:

Below, a circling fence, its leaves are seen
    Wrinkled and keen;
No grazing cattle through their prickly round
    Can reach to wound;
But as they grow where nothing is to fear,
Smooth and unarm'd the pointless leaves appear.

Thus, though abroad perchance I might appear
    Harsh and austere,
To those who on my leisure would intrude
    Reserved and rude,
Gentle at home amid my friends I'd be,
Like the high leaves upon the holly tree.

And should my youth, as youth is apt, I know,
    Some harshness show,
All vain asperities I day by day
    Would wear away,
Till the smooth temper of my age should be
Like the high leaves upon the holly tree.

The high leaves upon our holly, however, it will be noticed, are spiny-pointed. Whether the teleological purpose is that indicated by the poet's intuition is open to question.* Dr. Mellichamp writes :

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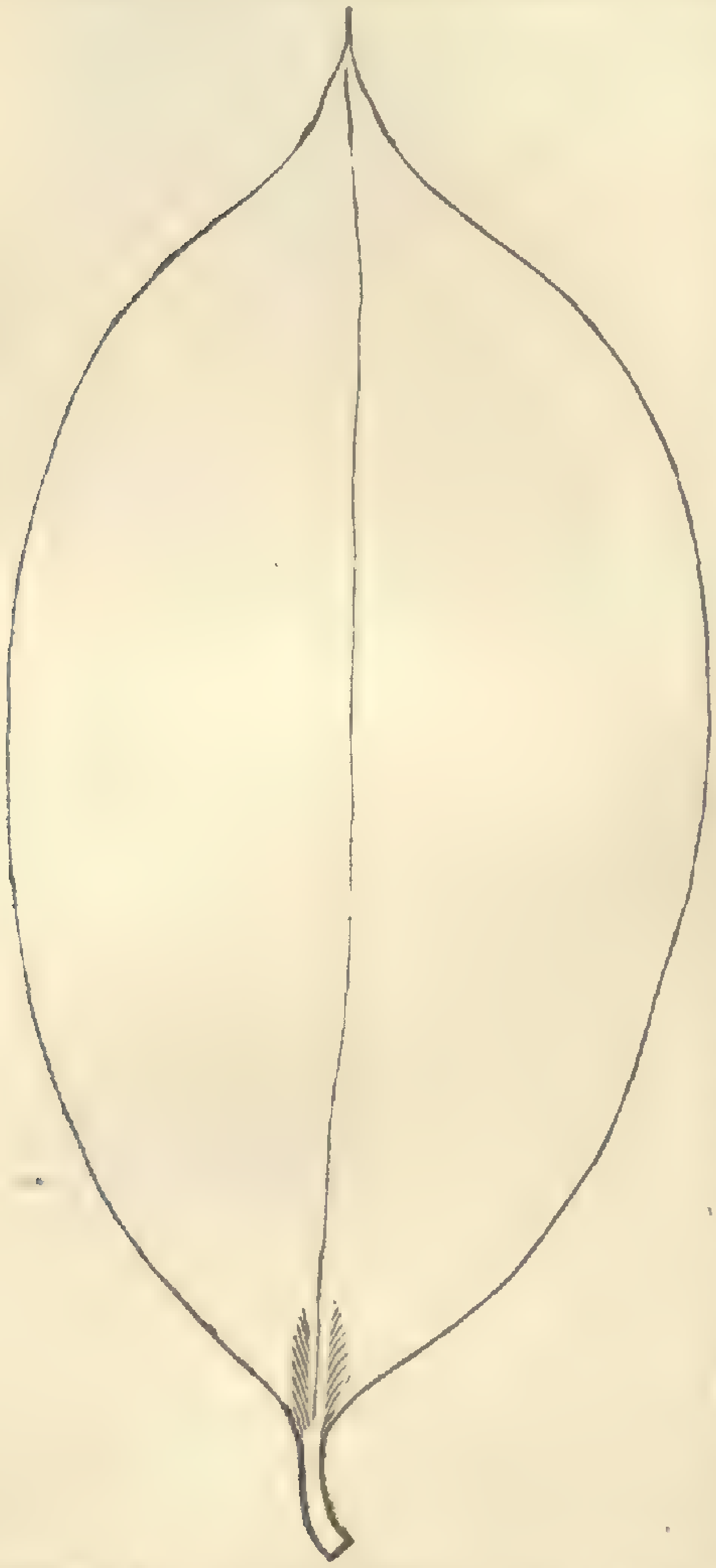
* Since writing the above, Mr. Meehan informs me that various correspondents in New England have sent him this species under the belief of its being indigenous. He also tells me that Miss Cope, of Germantown, also found it this season in the Catskills, whether at the same locality I cannot say. J. H. R.



I send for examination several specimens of a spineless holly (*Ilex opaca*)† which I first observed last year ; and I would like to learn whether such a condition is not unusual. The tree, which was quite vigorous, and about 20 feet high, was growing in a swamp almost touching a young gum tree, both of them having been prostrated in the late severe storm. The roots were both so closely intermingled that it was difficult to distinguish them. I at first supposed that no *spiny leaves* could be found on the whole tree, but, after more careful examination, I found a *few* on the lower branches, but none anywhere else. Two or three fine specimens of *Ilex Dahoon* grew quite near, the surrounding growth being *Nyssa*, *Gordonia*, sweet-gum, etc. Not far off I also observed another holly,‡ much larger than the former, and, on this, at least half, or perhaps two-thirds, of the leaves were *spineless*. This had no fruit, and the leaves, as you will observe from the specimens sent, are very much smaller. Is this a male? I enclose leaves of *Andromeda nitida* (from the same swamp) which the spineless holly leaves somewhat resemble.

Bluffton, S. C., Sept. 8, 1881. J. H. MELLICHAMP.

§ 107. **Abnormal Growth in Clover.**—The newspapers of Eastern Pennsylvania have had numerous complaints from farmers about the general failure of clover blossoms. Some brought to my attention had the teeth of the calyx developed to leaflets. The petals were wholly aborted, and the stamens reduced to small, green, and partially flattened filaments. The most singular change was in the style and stigma, the former being a perfect petiole, with an articulation and single leaflet in the place of a stigma. In a few instances there were three leaflets, the pistil thus becoming a perfect clover leaf. If there was any doubt about the accepted morphological views of the typical structure of flowers, they would fade before such illustrations as these. The great prevalence of this character in clover this season was certainly remarkable. I saw fields in which perhaps one-fourth the crop had heads like these ; though rather in patches than spread regularly all over the ground. There was also a perceptible yellowish tint in the patches with the most of these abnormal characters. I could not find any trace of fungus development in these specimens, yet from analogy—the pale tint following fungus attacks in other plants—I think it must have been from such organisms below the reach of ordinary microscopic power, interfering with nutrition, that these curious morphological results were developed. My observations of plants generally lead me to believe that we must look to the physiological functions of plants, and the laws which affect them, before we can comprehend the morphological change which they undergo.

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* Dr. Withering says in a foot-note : "It has been observed, I think by Linnaeus, that the lower branches within reach of cattle bear thorny leaves, whilst the upper ones, which stand in need of no such defence, are without them."

† One of the specimens is shown in the accompanying cut.—EDS.

‡ This, too, had been thrown down.

Germantown, Pa. THOMAS MEEHAN.

§ 108. **Plants of Northampton and adjoining Counties, Penn.**—While making occasional botanical trips for the past few years to Nockamixon Township, Bucks County, I detected the following plants, which Dr. J. S. Moyer, of Richland Centre, who has published a catalogue of plants of this county, informed me are new to the flora:

Liparis Loeselii, Richard, found growing along a wet mossy bank near Narrowsville, July, 1874.

Struthiopteris Germanica, Willd., found in profusion and great luxuriance along the bank of the Delaware River near Narrowsville, May 22, 1879.

From the mountains near Bauer's Rock, Lehigh County, Robert Rau in 1868 collected the rather scarce and local plant *Pogonia pendula*, Lindl., which is the only source of specimens I have for this region.

Reseda lutea, L., and *Glaucium corniculatum*, Curtis, I found growing in tolerable abundance upon piles of African iron ore near the works of the Bethlehem Iron Co. Mr. I. C. Martindale, to whom I am indebted for the identification of the species, states that both plants are natives of Europe ; whether also of Northern Africa he does not state, although it seems not improbable.

Atriplex patula, L., var. *hastata*, several years ago made its appearance along the railroads near Bethlehem.

Lepidium campestre, Linn., was collected by R. G. Bechdolt along roadsides south of Bethlehem.

Bethlehem, Pa. E. A. RAU.

§ 109. **Symphoricarpus racemosus**, Michx., var. **pauciflorus**, Robbins, in New York State.—I have specimens of this plant which I collected in July, 1878, at the top of a bluff on the western shore of Lake Champlain, near Port Henry, Essex Co., N. Y. Quite a large patch was growing there, and its small leaves and few flowers mark it as a good variety.

N. L. BRITTON.

§ 110. **Portulaca oleracea**, L.—Is common purslane cleistogamous? Picking up a piece of purslane, while waiting for a train, I was struck by the fact that none of the many flowers on it seemed ever to have opened. Most of them were distinctly marked with the line of future dehiscence, and contained well formed ovules, the more advanced ones already turning brown. In the smallest flowers examined the ovules had assumed form, but the anthers had not yet discharged their pollen. In those a little larger this discharge had taken place, while in those still more advanced the deliquescent flower was entirely enclosed. In all of them the outer sepal embraced the inner, surmounting it with its pointed crest, and showing no signs of their ever having been parted for the displ ayof the flower.

Considering how many competent observers have studied this plant, none of whom, I believe, has noticed its cleistogamy, and how little opportunity I have had for watching its flowering, it is with diffidence that I raise the question, and would be glad to have my notion confirmed or disproved.

In Le Maout and Decaisne, French edition, p. 442, are figures better illustrative of this point than Sprague's in Gray's Genera, particularly a section of an unopened flower. The aril-like expansion of the end of the funiculus does not appear in Le Maout and Decaisne's illustration, and is hardly adequately represented in Gray, Tab. 99, Figs. 8 and 9.

Sept. 17, 1881. W. H. L.

§ 111. **Notes from Chemung County, New York.**—I had the good fortune to find on the fourth of July, 1881, good flowering plants of *Liparis Loeselii*, Richard. It was growing in patches on the moist ledges of the Wellesburg Narrows, amongst moss. This is the only locality for it known to me in this part of the State. In 1874 I found one specimen of *Cacalia atriplicifolia*, L., at the side of the railroad at Wellesburg, but have never seen another since. May the seed have been dropped from a passing train? I also found one clump of *Arisaema Dracontium*, Schott, and *Lophanthus scrophulariaefolius*, Benth., last season on the bank of the Chemung; *Lilium superbum*, L., also grows sparingly along the Chemung, and in 1874 I found there one specimen of *Cassia Marilandica*, L.

I will exchange for rare plants from other parts of New York, and desire to correspond with working botanists in all parts of the State.

Lowman, N. Y. T. F. LUCY, M.D.

§ 112. **Notes on Polygala and Lechea.**—In August, while rambling about Cotuit Port, on the south shore of Cape Cod, I picked up a piece of *Polygala Senega*, L., in an open woods; there did not seem to be much of it just in that spot, and my companion, not being a botanist, did not leave me time to search for it at my leisure, especially as I had forgotten that this is further east than it has been reported. Not a great ways off, *Genista tinctoria*, L., was found growing thriftily in several patches.

Lechea maritima, nobis, *L. thymifolia*, Gray, not Pursh, abounds about Cotuit. I saw no other species of *Lechea* abundant there; though *L. major*, Mchx., and *L. thymifolia*, Pursh, (*L. Novae-Caesareae*, Austin), are found in the vicinity. *L. maritima* was constantly under my eyes, but I never saw the flowers opened, till on a bleak, sunless day, during a northeasterly gale, about the 18th of August, I noticed that the Lecheas in a hollow through which I was passing were all in bloom. So different was the aspect of the plant, that it at once arrested attention. The next day, and the next, I found other patches in bloom, patches with which I was familiar, as they were near the house. Rosa, a child of ten, who knew pin-weed quite well, brought me a piece of the full-blown plant to learn its name. She did not recognize it in its new dress. The small petals were of a brownish-red, but the conspicuous stigmas were white with a yellowish tinge. This is the only time I have seen *Lechea* in full bloom.

W. H. L.

§ 113. **A large Grape-vine.**—In a wooded ravine near Egbertville, Staten Island, there is a vine of *Vitis cordifolia*, Michx., having a circumference of twenty-five and one-half inches at a point three feet above its base. It completely covers three cedar trees, each at least thirty feet high, and is a very beautiful plant.

N. L. B.

§ 114. **Cheilanthes myriophylla,** Desv.—I desire specimens of this fern, *with root-stocks*, from Mexico or South America, for a special study of the *Myriophylla-Fendleri* group of *Cheilanthes*.

I will be glad to communicate with any one who can put me in the way of obtaining them, and to return specimens of other species in exchange. Address,

Medford, Mass., U. S. A. GEO. E. DAVENPORT.

§ 115. **Woodsia obtusa,** Torrey.—I would like to obtain some full suites of specimens of this species in different stages of development, from the Middle, Southern, or South-western States, and will be glad to make such exchanges for them as I can.

Medford, Mass. GEO. E. DAVENPORT.

§ 116. **Botanical Notes.**—*A Locomotive Dicotyledon.*—An interesting case of voluntary motion among dicotyledonous plants, in a species of *Loranthus*, has been discovered by Dr. G. Watt, of the Educational Department, Bengal Lower Provinces, and made known in a recent number of the *Gardeners' Chronicle.* It is only while the seed is germinating that the motion takes place, but the mode of travelling is very peculiar and quite different from that of any other known plant. The plant is a native of Bengal, and like all other members of the genus is parasitical, growing upon a few evergreen trees, particularly upon some species of *Memecylon.* The fruit, like that of its relative, the mistletoe, and nearly all other members of the order, consists of a mass of very viscid pulp surrounding a single seed, and on separating from the parent plant adheres to whatever it may chance to fall upon, and after a time begins to germinate. It is only during the first stage of germination that the motion to be described takes place, and it is evident that the power of being able to move about is to enable the plant to find a suitable place to grow upon. The radicle at first grows out, and when it has attained a length of about an inch it develops upon its extremity a flattened disk, and then curves about until the disk is applied to any object that is near at hand. If the spot upon which the disk fastens is suitable for further development of the plant, germination continues, and no locomotion takes place; but if, on the contrary, the spot should not be favorable, the germinating embryo has the power of changing its position. This is accomplished by the adhesive radicle raising the seed and advancing it to another spot; or, to make the process plainer, the disk at the end of the radicle adheres very tightly to whatever it is applied; the radicle itself straightens and tears the viscid berry away from whatever it has adhered to, and raises it in the air. The radicle then again curves and carries the berry to another spot, where it again fixes itself. Dr. Watt says he has seen this repeated several times, so that to a certain extent the young embryo, still within the seed, moves about. It seems to select certain places in preference to others, particularly the leaves, which in the *Memecylon* are evergreen and very dense. The berries on falling are almost certain to alight on the leaves, and, although many germinate thereon, they have been frequently observed to move off the leaves on to the stems, and finally fasten there.

Fertilization of Clover.—Meehan's *Gardener's Monthly* for September contains, as usual, some matters of special interest to botanists. Prof. J. W. Beal gives the result of three years' experiments to ascertain whether red clover not visited by bees will produce seeds. The experiments were made by covering some heads and comparing them with others uncovered. It would appear that the covered heads often produced a considerable number of seeds; but, as sometimes they produced none, and, "in nearly every case, the heads which were covered soon fall to the ground, where they remain until ripe," the experiments seem inconclusive and require to be repeated with more care and with a larger number. The germinating powers of the seed should also be tested.*

Gordonia pubescens.—In the same number of the *Gardener's Monthly*, Mr. Ravenel gives a history of the discovery and loss of *Gordonia pubescens*, L'Her., which was last seen in the uncultivated state, by Moses Marshall in 1790, as stated in a letter in Darlington's Memorials of Bartram and Marshall, which does not seem to be referred to by Watson in his Bibliography.

A monstrous Cypripedium.—In the September number of The *Druggist*, Chicago, Professor Bastin describes and figures a monstrous *Cypripedium* found last June in the pine barrens at the southern end of Lake Michigan. It had all three sepals distinct and of equal size, and the three nearly equal petals were shaped alike, differing from the sepals only in being a little narrower and of course alternating with them. The ovary was not twisted, and only slightly bent to one side, so that the flower faced more nearly upward than in the ordinary form. The column, as usual, consisted of united stamens and pistils, but it was much less bent to one side, and the union of parts was not nearly so complete. There were three distinct anthers instead of two, alternating with the lobes of the distinctly three-lobed stigma. Instead of one large, dilated, triangular, fleshy body, apparently occupying the place of the third stamen in the ordinary form, and heretofore supposed, in fact, to be homologous with the third stamen, there were two of these bodies alternating with the petals and evidently belonging to a distinct whorl. They may really be the homologues of stamens, but, if so, the plan of the flower contemplates two distinct sets of stamens; or we may regard them as petals belonging to an inner whorl that alternates with the first. *C. spectabile* with a double labellum is recorded in BULLETIN iii, 33.

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* In an editorial Mr. Meehan refers to these experiments in corroboration of his own experiments and conclusions that there are many reasons why clover does not seed, aside from mere questions of pollinization.

§ 117. **Botanical Literature.**—*Botany for High Schools and Colleges*, by Chas. E. Bessey.—American Science Series, Henry Holt & Co., N. Y.—This book has been more than year before the public, and has, we have been assured, been found of great practical value. It may not, however, be too late for us to record our sense of its merits. It is thus far the only work which affords to students in this country a full introduction to the latest results of vegetable biological studies, within moderate compass and at moderate cost. Professor Bessey is the botanical instructor in the Iowa Agricultural College, and he has learned by experience what are the needs of American students, and constantly refers to native plants for his illustrations. The first twelve chapters are devoted to vegetable biology in the more limited sense, from protoplasm, cells, tissues and organs to the chemistry of plants and their relations to external agents. This part is founded mainly upon Sachs's *Lehrbuch*, though frequent reference is made to other recent authorities, but as Prof. Bessey is himself an investigator and has to teach others to investigate (which indeed is the leading idea of his book), he by no means follows his authors in a servile manner. It seems to us, nevertheless, that he is a little infected with German dryness as is not unnatural in a first edition of a book on a technical subject, in which the Germans are masters. The book was intended as a companion for the laboratory, and as such, perhaps, we should not complain of it, but it was also intended for the general reader, and in his interest we recommend a little greater solution of the solid contents. For it must be borne in mind that many will want to learn from this book who have not the advantage of witnessing Professor Bessey's skill in working. In our country many take up the study of botany as a relaxation, knowing nothing of the use of the microscope or the method of preparing objects for it. It would be well, then, we think, in a work of this class, to give some instruction, at least of an introductory character, on these subjects. What with compound and binocular microscopes, section-cutters, polarizers, apparatus for mounting slides, and other accessories, the beginner is deterred from beginning; and yet much good work is done in Germany without these. Some account of the best form of a simple dissecting microscope, and the methods of hardening or softening objects for slicing, etc., we think should accompany every popular botany. We would not be understood, however, as implying that this work is more than usually deficient in this respect, on the contrary, the reverse is the case; but still, far too little is done.

We notice that in the *American Naturalist* for September, of the Botanical department of which Prof. Bessey is editor, that he has frequent calls from learners on this subject, and suggests that some microscopist should prepare a certain set of specimens. That, no doubt, would be one step toward the desired object, as showing the student what to look for, but not aiding him much in his own investigations.

The remaining chapters, to the 20th inclusive, contain an account of the classification of plants with notes upon their economic value. In the arrangement of the lower orders the author has made some innovations which, in practice, he finds useful. This list of alliances and orders, which in the Dicotyledons comes near to that of Bentham and Hooker, is a convenience which adds greatly to the usefulness of the work.

The last chapter, xxi, is on the number of species of plants, their affinities, and their distribution in time. Full indices to the text and illustrations complete the work, which well meets an increasing desire for information on its subject.

Preliminary Catalogue of the Flora of New Jersey, compiled by N. L. Britton, for the Geological Survey of New Jersey.—A considerable number of copies of this Catalogue have been distributed among those who have worked in this field, that by their assistance errors may be eliminated and additions made either of plants or localities that have escaped the notice of the energetic and scrupulous compiler. It is requested that the books be returned to Prof. Geo. H. Cook, State Geologist, New Brunswick, N. J., at the close of the season of 1882. The list takes in all the botanical orders as far as the workers have reported.

This Catalogue promises to be the most complete of any in this country, and it is to be hoped that all who have any old observations to report, or who have the facilities for investigating further in this field, will make use of this rare opportunity to contribute to what will long be the guide to the study of the New Jersey Flora.

Trimen's *Journal of Botany* for September contains: 'In Memory of Hewett C. Watson' (with plate), by J. G. Baker; 'Synopsis of the Genus *Pitcairnia*,' by J. G. Baker; 'On a New *Araliacea* of uncertain Origin,' by H. F. Hance; 'A New Tree Fern from Jamaica,' by G. S. Jenman; and 'In Memory of Reginald Pryor,' by James Britten.

The *Botanical Gazette* for September contains: Notes on *Chapmannia* and *Garberia*, by A. H. Curtiss; Botanical Notes from Illinois, by Rev. E. J. Hill; *Nasturtium lacustre*, by A. F. Foerste; Albinism, by Thomas Meehan, in which the author notes a case of reversion of white to blue flowers in *Wahlenbergia grandiflora*; Note on the rootstocks of *Convolvulus sepium*, by W. W. Bailey; and an article by Davis L. James, describing the method of dissemination of the seeds of *Nymphaea odorata*.

Grevillea for September contains a lengthy and interesting article by Mr. Charles B. Plowright, on ' Mimicry in Fungi ;" ' New British Lichens,' by Rev. J. M. Crombie ; ' Observations on *Parmelia olivacea* and its British Allies,' by Rev. J. M. Crombie ; and ' New Zealand Desmidiaceae,' by William Archer.

We acknowledge the receipt of the Nineteenth Annual Report of the *Schlesischen Tausch-Vereins*, from Mr. Adolph Toepffer, Brandenburg a. d. Havel, Prussia.

Plants of Northwestern Australia.—We are indebted to Baron F. von Mueller for a copy of his notice of the plants collected by the Messrs. Forest and Carey in the little-known district about Nickol Bay and King's Sound. Without going into the subject of the bearing of the collections on the knowledge of the distribution of Australian plants in particular, we think our readers will be more interested in seeing what familiar genera are represented in these lists. The author has a suspicion that *Phaseolus vulgaris* may have strayed from cultivated grounds (there is a scanty overland travel with flocks); perhaps traffic may account for some others.

Nymphaea, 1 species ; *Lepidium* 3, *L. ruderale*, L., among them ; *Cleome*, 2 ; *Capparis spinosa*, L.; *Polygala*, 1 ; *Drosera*, 2 ; *Claytonia*, 1 ; *Sida*, 6 ; *Abutilon*, 4 ; *Hibiscus*, 4 ; *H. Goldsworthii*, F. v. M., " a highly ornamental shrub ;" *Waltheria Americana*, L., and *W. Indica*, L.; *Erodium*, 1 ; *Strychnos Nux-vomica*, L.; *Euphorbia*, 3 ; *Salsola Kali*, L.; *Atriplex*, 2 ; *Polygonum lapathifolium*, L.; *Celastrus*, 1 ; *Cassia*, 3 ; *Crotalaria* 2 ; *Phaseolus vulgaris*, L.; *Indigofera*, 3 ; *Tephrosia*, 1 ; *Galactia*, 1 ; *Rhyncosia*, 1 ; *Ammania*, 1 ; *Oldenlandia*, 1 ; *Pluchea*, 1 ; *Aster*, 1 ; *Flaveria*, 1 ; *Gnaphalium*, 1 ; *Lobelia*, 1 ; *Ipomoea*, 5 ; *Convolvulus*, 1 ; *Evolvulus*, 1 ; *Samolus*, 1 ; *Heliotropium*, 8, *H. curassavicum*, L., one of them ; *Justicia*, 1 ; *Mimulus*, 2 ; *Solanum*, 3 ; *Commelyna*, 2 ; *Potamogeton*, 1 ; *Fimbristylis*, 2 ; *Fuirena*, 2 ; *Rhyncospora*, 1 ; *Scirpus litoralis*, Sch., *S. maritimus*, L., and *S. supinus*, L.; *Cladium*, 2 ; *Cyperus*, 5 ; *Sporobolus*, 1 ; *Eragrostis* 3 ; *Panicum*, 3 ; *Aristida*, 1 ; *Setaria viridis*, Beauv., *S. verticillata*, Beauv., and *S. glauca*, Beauv.; *Andropogon*, 4 ; *Erianthus*, 1 ; *Phragmites*, 1 ; *Acrostichum aureum*, the only fern. *Oryza sativa* was found by the author in 1856, near the West Australian boundaries.

Macrozamia Moorei is a new *Zamia* from the mountains of Queensland, described by Baron F. von Mueller in the Victoria *Pharm. Jour.*, March, 1881. A stem four feet high and five and a half in circumference has been sent to Kew.

Catalogue of the Phaenogamous and Vascular Cryptogamous Plants of Michigan, indigenous, naturalized and adventive. 8vo, pp. 105 By Charles F. Wheeler and Erwin F. Smith. Hubbardston. Mich.—This useful, recently-published catalogue contains the completest list that has as yet been given of the plants of Michigan. The number of species enumerated is 1,634, but it is expected that these figures will be considerably increased after certain unexplored portions of the State have been visited. The work is very neatly printed and is accompanied by a colored map of the State, and a preface giving an account of its botanical features.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. VIII.] New York, November, 1881. **[No. 11.**

§ 118. New Species of Plants, chiefly New Mexican.

By Edward Lee Greene.

Talinum confertiflorum.—Root perennial, thick, fleshy and more or less branching; stems several, branching and leafy; leaves fleshy, terete or nearly so, an inch or more long; peduncles leafless, slender, 3–5 inches high, each bearing a crowded cyme at the summit; bracts subulate; sepals ovate, with thickened, purple tips; corollas small, apparently white; stamens 5; capsules triquetrous; seeds small.

Collected in the Pinos Altos Mountains in 1880, by the writer in too advanced a state, and distributed under the name "*T. parviflorum*, Nutt." Dr. Gray afterwards informed me, from Kew., that it was not that species, but probably a new one; and now I have a specimen from Mr. Rusby, collected this year in the Mogollon Mountains, showing the five-stamened flowers.

The species, except as regards the number of stamens, and the compact cymes, is much like the Eastern *T. teretifolium.*

Saxifraga fragarioides.—Cespitose, the short, much-branched caudex thick, woody and clothed with the dark brown, persistent, petioles of preceding seasons; leaves an inch or more long, cuneate-obovate, entire below the middle, above coarsely and deeply toothed, the under surface pale, the upper dark green, with a few scattered hairs along the five prominent veins, some short, minute, glandular ones on both surfaces, and the margins sparingly ciliolate; petioles ½ inch long, dilated at base; scape rigid, a span high, glandular-hirsute, naked, or with one or more small leaves below; cymes subtended by small, lanceolate bracts, and arranged in a narrowly thyrsiform panicle; flowers 3 lines broad; petals spatulate, greenish, a third longer than the ovate-lanceolate, spreading sepals, persistent; carpels distinct nearly to the base.

High mountains west of Mt. Shasta, California, August, 1881. One of several most charming novelties brought in from that interesting, but not very new region, by that most zealous and careful collector, C. G. Pringle, Esq.

The leaves of this fine saxifrage are a most precise imitation of the leaflets of the common wild strawberry, both as regards their form, color, texture, and even size.

Ribes (Ribesia) Mogollonicum.—Glabrous and sparingly glandular, 6–10 feet high; leaves 1–3 inches wide, 5-lobed; the lobes triangular, doubly serrate; petioles one inch long; racemes few-flowered, subcapitate, on erect peduncles which surpass the petioles; bracts rhombic-ovate, the lowest somewhat spatulate, their margins glandular; flowers small; ovaries clothed with stalked glands; calyx-tube very short; sepals ovate-oblong, campanulate-spreading, greenish and marked with dark green or purplish veins; petals white, spatulate, very small; berry smooth, black, edible.

Deep, cold ravines near the summits of the Mogollon Mountains. Collected by the writer in flower in April, 1881; also observed in fruit, in the same locality at a later date by Mr. Rusby. The foliage has some of the odor of the English black currant, and the nearest ally of the species is *R. floridum* of the Eastern States, from which it is readily distinguished by its short racemes on erect peduncles.

Primula Rusbyi.—Green and glabrous except the upper portion of the pedicels and the base of the calyx, which are densely white-mealy; leaves thin, spatulate-oblong, 2–4 inches long, pale beneath, the margins rather strongly denticulate; scape 6–10 inches high, slender, 6–10-flowered; bracts of the involucre ovate- or lanceolate-subulate 2–5 lines long; pedicels $\frac{1}{2}$–$1\frac{1}{2}$ inches; calyx ovoid-campanulate, the triangular-subulate lobes much shorter than the tube; corolla deep purple with yellow eye; the obcordate lobes 4–5 lines long, each bearing a small, subulate, central tooth; the tube narrowly funnelform, twice as long as the calyx; root a rather dense tuft of somewhat fleshy fibres.

On rich, moist slopes, near the summits of the Mogollon Mountains in New Mexico, August, 1881. Collected by Mr. H. H. Rusby, whose zealous labors amid so many dangers and difficulties as attend all botanizing in that field, are now crowned by the discovery of so splendid a new species, as rarely falls to the lot of any botanist, now-a-days, to find. Since the discovery of *Primula Parryi* of the Colorado Mountains, that superb species has held an unquestioned title to the first rank, in point of beauty, among American species of this elegant genus. In *P. Rusbyi* it has a formidable rival. This plant, while having corollas fully as large, and as richly colored, has a more slender and graceful habit; moreover, its calyces and pedicels, so conspicuously white-farinose, contribute much to its beauty. Being indigenous to both a lower latitude and a less altitude than *P. Parryi*, it would doubtless be much more easily brought into cultivation, when it could not fail to take rank among the most admired members of this favorite family.

Phacelia coerulea.—Near *P. crenulata*, which in foliage and pubescence it closely resembles, but taller, 1–2 feet high, commonly with a few erect branches from near the base; corollas less than half as large, 2–3 lines broad, pale blue; styles and stamens not exserted; seeds 4, barely one-third as large as in *P. crenulata*, almost linear in shape, minutely reticulated; fresh herbage with a sharp mephitic odor.—*P. crenulata* of the Synoptical Flora in part, but not of Bot. King.

Southern New Mexico and Arizona; common in rocky canyons, and on precipitous mountain sides. True *P. crenulata*, Torr., common in the same region, is found only on open plains or grassy hillsides, and differs in its twice larger, deep violet corollas and long-exserted styles and stamens, as well as in its lower and stouter habit. The circumstance which led to the distinguishing of the two species was the striking difference in odor of the fresh herbage. *P. crenulata* has a heavy, sickening, canine odor; *P. coerulea* has the sharper, but less offensive smell of the skunk.

Urtica gracilenta.—Annual, 3–6 feet high, simple, or sparingly branched from the base, nearly glabrous, and with scattered bristles; leaves thin, the lower orbicular-, the middle ones rhombic-ovate, and the uppermost ovate-lanceolate, mostly acute, and all very coarsely and incisely toothed, 3–4 inches long on very slender petioles two-thirds as long; stipules small, lanceolate; racemes slender, nearly equalling the petioles.

This remarkable nettle I first saw in the Mimbres Mountains of New Mexico, in the month of May, 1877. Again, early this year I found dead stems of it, fully six feet high, in canyons of the Mogollones in the same Territory. Still later, in the herbarium of Mr. Lemmon at Oakland, I observed dried specimens of very young plants, collected in the Santa Cataline Mountains of Arizona in the spring of 1880. Mr. Rusby has more recently sent me, from the Mogollones, specimens in flower, collected in August of this year. It appears to be dioecious; at least my specimens show only male flowers.

Zygadenus porrifolius.—Bulb oblong, an inch or more long, with white outer coats; stem 2 feet high; leaves thin, pale, somewhat glaucous, 3–6 lines wide and a foot or more long; raceme simple, or below sparingly branched, rather loosely flowered; bracts ovate-lanceolate, green and glaucous; pedicels ½–1 inch long; flowers small, nodding; perianth adnate, and persistent upon the capsules until the ripening of the fruit; segments broad, 3 lines long, greenish, none of them unguiculate or much contracted at base; gland elongated, truncate or obcordate; capsule 6–8 lines long.

Mogollon Mountains, near the summits, 1881. The pale and soft, garlic-like leaves, and the last season's dead stems bearing empty capsules, were observed by myself last April. The specimen, in flower, from which the description is drawn, was collected by Mr. Rusby in August.

§ 119. New Ascomycetous Fungi.*

By J. B. Ellis.

Peziza (Dasyscypha) Meleagris.—Sessile among the loosened fibres of the wood, brownish-purple, spherical at first and tardily expanding, .003′ in diameter, clothed externally and the margin fringed with purplish, sparingly-septate, minutely-roughened hairs, which are attenuated and lighter colored above so that the marginal fringe appears nearly white; disk dull white; asci sessile, oblong-cylindrical, .002′x.00025′; paraphyses stout, 2–3-septate and abruptly pointed above; sporidia simple, hyaline, oblong, .0003′x.0001′, mostly collected in the upper part of the asci.

On weather-beaten wood. May. (No. 71.)

Peziza (Dasyscypha) cenangioides.—Sessile, urceolate then expanded, .003′ in diameter, clothed externally and the margin fringed with brown, rough, septate hairs; disk dull white; asci cylindrical, .0025′x.00025′; paraphyses stout, septate below, scarcely thickened above, obtuse; sporidia 8, fusiform, hyaline, straight or slightly curved, and mostly narrowed at one end, .0006′–.0007 long

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*Collected in Pleasant Valley, Utah, by S. J. Harkness during the spring and summer of 1881. (Station about 6,000 feet above the level of the sea.)

On dead herbaceous stems. (No. 66.)

PEZIZA (DASYSCYPHA) CROSSOTA.—Sessile, greenish, spherical at first and with a narrow opening, expanding to concave, margin thickly fringed with greenish, straight, 4–6-septate, obtuse hairs, about .003′ long by .0003′ thick; disk livid when fresh, pale greenish when dry; asci cylindrical, abruptly narrowed below into a short stipe; paraphyses linear, faintly septate, stout, not thickened above; sporidia reniform-oblong, hyaline, continuous, .0003′–.00035′x.000125′.

On weather-beaten wood with No. 73. May.

This and the two foregoing species are closely allied, but are easily distinguished by the characters given.

PEZIZA (TAPESIA) EARINA.—Thin and soft, seated on a loose mycelium of dirty-white, matted, cottony hairs, orbicular, about one line broad, fibrous in texture; disk brick-red when dry; asci cylindrical, .005′x.0005′; paraphyses rather stout, thickened above; sporidia uniseriate, elliptical, hyaline (mostly with a nucleus,) about .0006′x.0003′.

On dead stems and leaves of grasses and on weather-beaten wood still partly covered with snow. April and May. (No. 67.)

PROPOLIS SPHAERELLOIDES.—Erumpent, orbicular, .008–0085′ in diameter, scarcely prominent when dry, but swelling out in little tubercles when moist and exposing a pale, flesh-colored disk surrounded by a subfimbriate, dark brown margin; asci clavate-cylindrical, .0018′–.0023′x.0003′–.0004′; paraphyses stout and mostly thickened above; sporidia biseriate, oblong or clavate-oblong, 2–4-nucleate and finally uniseptate, .0005′x.000125′–.00015′

Sometimes several individuals, ranged side by side, form an irregular ring around the stem of the *Juncus* on which the species is parasitic. Looks much like a *Sphaerella* when dry. (No. 79.)

ACROSPERMUM CORRUGATUM.—Liguliform, black, erect, .065′–.07′ high and .02′ wide, surrounded at the base by a mycelium of brown, matted hairs, strongly transversely striate on both sides, compressed and truncate above so that the apex is in shape like the edge of a chisel; asci linear, long and narrow, .018′–.02′x.0004′; paraphyses filiform, abundant, endochrome many-parted; sporidia linear, nearly as long as the asci, separating into cylindrical, 3-septate joints, .0007′–.0008′ long.

On weather-beaten wood. (No. 73.)

DOTHIDEA TUBERCULIFORMIS.—Stroma disciform, contracted below into a thick, narrow base, submarginate above, .003′–.004′ in diameter, of coarse, cellular structure, ascigerous cavities minute; asci oblong-cylindrical, .0013′x.0006′; sporidia biseriate, subhyaline, granular, uniseptate, .0006–.0007′x.000175′, septum mostly nearer one end.

On bark of dead twigs of some unknown tree or shrub. (No. 68.)

LEPTOSPHAERIA TENERA.—Gregarious, seated just beneath the cuticle, which is blackened by the mycelium of dark, sparingly-septate, branching threads; asci narrowly clavate, .003′x.0002′–.00025′; paraphyses nucleate; sporidia overlapping and crowded above, fusiform, 5-septate, yellowish, slightly constricted at the septa, and the next to the upper division slightly swollen, mostly straight,

.0006′-.0007′x.0001′-.000125′; perithecia small, .005′-.008′ in diameter, conic-hemispheric; ostiolum obtuse and somewhat shining,

On dead herbaceous stems.

Pleospora ciliata.—At first covered by the cuticle, but at length partly erumpent, .005′-.007′ in diameter, hemispheric, ostiolum large, surrounded by a fringe of stout, black, reflexed hairs; asci broad, oblong-elliptical, muriform, yellow, slightly constricted across the middle, .0013 x.0006. This appears to be sufficiently distinct from the other species of *Pleospora* with ciliated ostiola.

On dead stems of *Phlox* with *Puccinia phlogina*, Pk. Mr. M. E. Jones.

Sphaeria (Rosellinia) ovalis.—Gregarious or subcespitose; perithecia ovate, rough, about .013′ in diameter, ostiolum papilliform; asci narrow, cylindrical; sporidia uniseriate, simple, brown, variable in size and shape, from short-elliptic to oblong, .0003′-00035′x .0002′-.00025′.

On sage brush. (No. 10.)

Cucurbitaria occidentalis.—Perithecia crowded, depressed-hemispheric, quite flattened above, a little over .013′ in diameter; ostiolum papilliform; asci .0035′x.0005′; sporidia biseriate, oblong, slightly curved, yellowish, 4-5-septate, constricted in the middle, .0009′-.001′x.00025′; paraphyses abundant, matted together at the tips.

The part of the branch occupied by the fungus is swollen as in *Sphaeria morbosa*, Schw., but not so much so.

On sage brush. (No. 11.)

Cucurbitaria solitaris.—Perithecia solitary, cylindric-ovate, rough .02′ in breadth and height, ostiolum strongly papilliform; asci cylindrical, .005′-.0055′x.0007′; sporidia oblong-elliptical, constricted in the middle, uniseptate at first, soon becoming muriform and yellowish and finally dark brown, .001′-.0013′x.0005′.

On sage brush. (No. 12.)

Sphaerella fuscata.—Perithecia minute, densely crowded, forming elongated, dark-colored patches half an inch or more long, and half as wide; asci obovate, .0015′-.002′x.0006′-.0007′; sporidia oblong, uniseptate, mostly narrow at one end, hyaline, .0007′x.00025′, Perithecia ovate-conic, rough, subcuticular, but at length throwing off the epidermis and blackening the matrix.

On dead herbaceous stems. (No. 83).[*]

§ 120. **Albinism.**—I found on the shores of Elizabeth Pond, in the Adirondacks, Aug. 16th, a great many plants of *Pontederia cordata*, L., bearing white flowers. In several of the patches where the blue and white were mixed, the latter were in the majority. I also noted along the road near Indian River P. O. a patch of white-flowered *Epilobium angustifolium*.

Elizabeth G. Knight.

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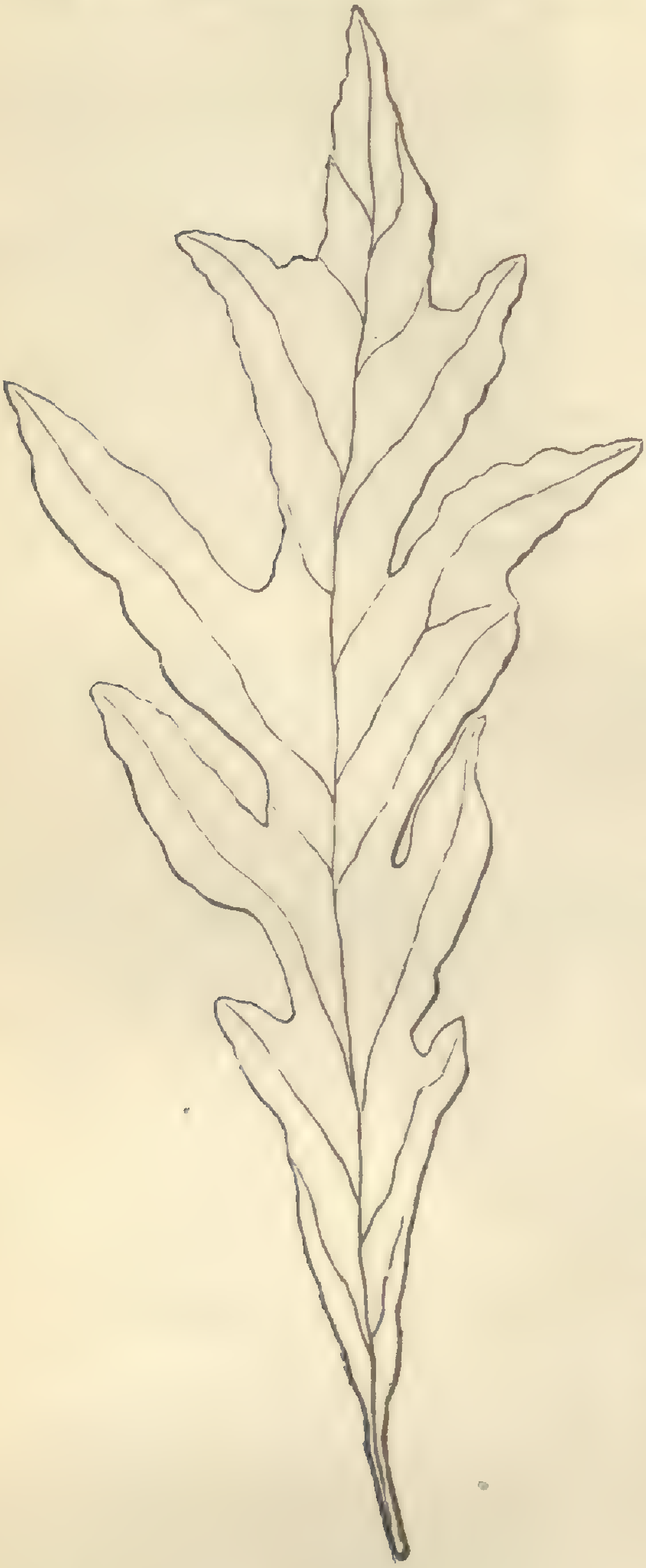
[*] Under *Lophiostoma tingens*, page 90, Vol. viii of this Journal, it should have been stated that the wood on which this species grows is tinged with a dull red color. This *Lophiostoma* is almost invariably found in company with *Phoma consorta*, C. & E., which is probably its pycnidial stage.—J.B.E.

§ 121. **Peculiarly-lobed Leaves in Quercus alba,** L.—The leaves of oak trees present so great a diversity of shape and outline, that any attempt to indicate unusual or peculiar forms may be considered superfluous. A case however, of so great a divergence from the typical form as represented in the accompanying sketch, drawn from one of many similar specimens in my possession, may prove of sufficient interest to be placed on record.



The tree from which the leaves were taken grows on the farm of Dr. J. B. Potter at Bridgeton, Cumberland Co., N. J., and is now some six or seven feet in height. Its leaves all have the peculiar lanceolate, or oblanceolate outline, and narrow, mostly acute lobes of the one shown in the sketch, and, indeed, some are still more elongated. The peculiarity has existed ever since the tree was first noticed, a few years ago; there are no other trees like it in the vicinity, and Dr. Potter has never before seen anything resembling it. A number of other species of *Quercus* grow in the neighborhood, but there is nothing to indicate that this is a hybrid form, and it probably is merely a sport of the white oak.

N. L. BRITTON.

§ 122. **Simblum rubescens,** Gerard, **in Iowa.**—To-day a young man in one of my classes in botany brought me several specimens of a plant which had excited his curiosity. Upon examination they proved to be *Simblum rubescens*, Gerard, described in the BULLETIN in January, 1880. Two of the specimens showed the abnormal double stipe.* I fail to see any departure in the Iowa specimens from the form of the species so well described by Mr. Gerard.

Ames, Iowa, Oct. 5, 1881. C. E. BESSEY.

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* Illustrated in Plate ii, Vol. vii.

§ 123. **Marsilia quadrifolia in Massachusetts.**—It seems to be the opinion of the most eminent writers on botany that the *Marsilia quadrifolia* is found in this country only at Bantam Lake, Conn. Dr. Gray makes such a statement in his Manual; but in the BULLETIN, iii, p. 3, he states that it is well established in Fresh Pond, near Cambridge, Mass., although known to have been first introduced from Connecticut.

Prof. Meehan, in his "Native Flowers and Ferns," writes that "doubt is thrown on its existence in Texas, or indeed anywhere but in the one locality at Bantam Lake." In *Silliman's Journal* some years ago Dr. Gray put the question: "Is its rarity a sign that it belongs to a very old family about becoming extinct, or is it one of the newer introductions of Nature, which has not yet had time to spread here to any great extent." The latter supposition seems the more probable, as I have found several comparatively large areas of the plant in a remote part of the Charles River, above Dedham, Mass.

The long distances of these habitats from settled districts forbid the supposition that the plant was introduced there from Connecticut, though that is not impossible. Its thrifty appearance gives no indication that it is gradually dying out, but rather that it is spreading. Not only does it take possession of a large water area in the places where it was seen, but it encroaches a foot or more on the low margin of the river, where the leaves, although densely crowded, are very much smaller than those on the surface of the water. The sporocarps seem to be most numerous just at the edge of the water.

Roxbury, Mass. HENRY L. CLAPP.

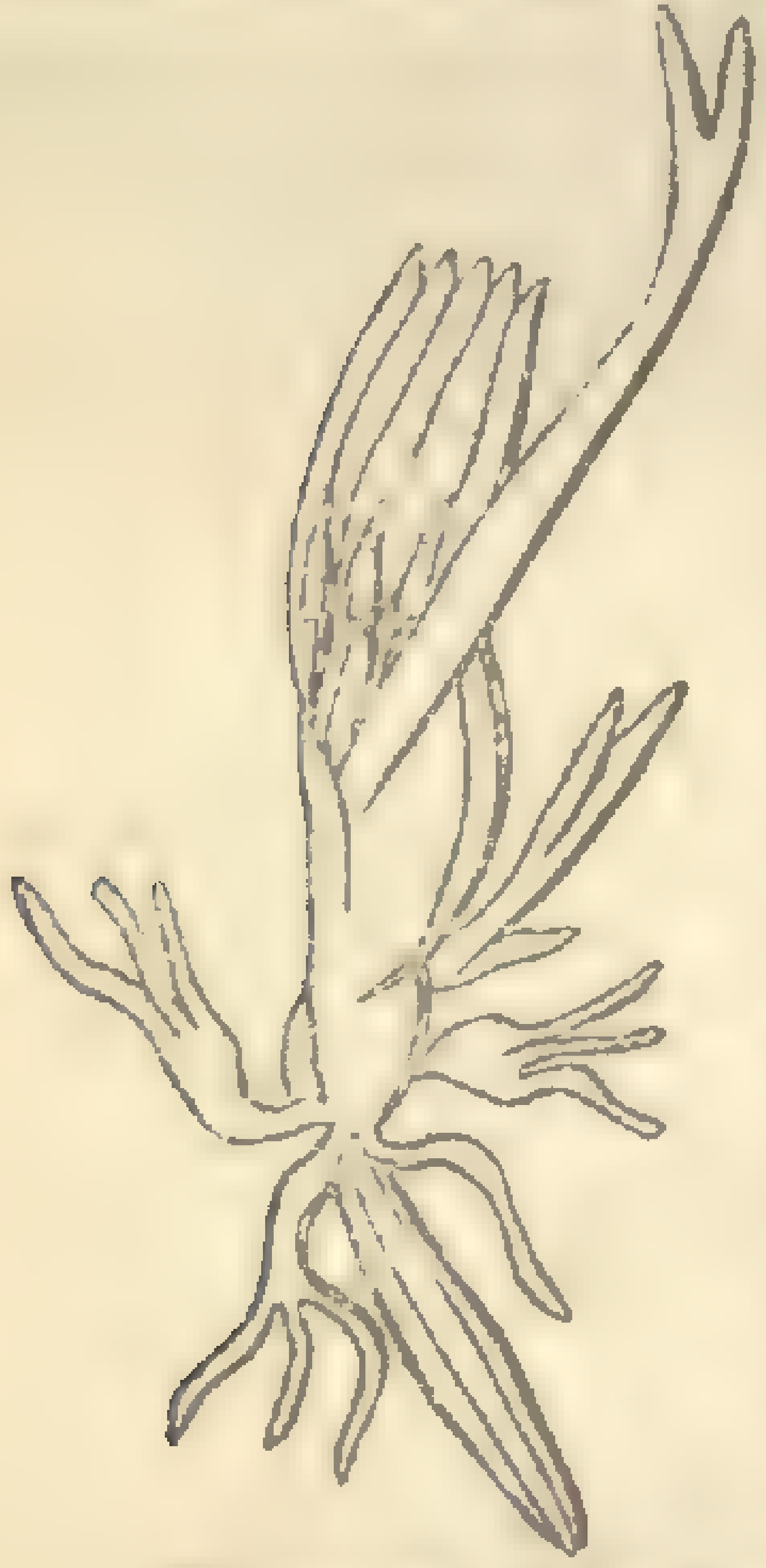
§ 124. **Growth of Exogens. II.**—Mr. John Foster, of Pleasantville, an intelligent member of the Society of Friends, and a practical nurseryman, after reading my article on the Growth of Exogens published in the BULLETIN of March, 1878, writes me as follows: "I can scarcely say that I am a full convert to thy theory of the formation of rings in the growth of timber, or hardy trees and shrubs of our climate, I have so often verified the correctness of the theory of one ring in a year. There is one particular case to which I should like to draw thy attention. A few years ago a tract of woodland was cleared off which stood directly west of Robert Parson's house in the village of Flushing, L. I., and, no doubt, has been frequently noticed by thee. An old gentleman, a member of the Society of Friends, told me that he recollected seeing it cut off by the British soldiers during the Revolutionary War, when he was thirteen years old. At the time it was cut off the second time, I counted the rings of many of the cross-sections of the largest trunks and found that the number of rings answered with wonderful regularity to the number of years which had elapsed since the timber was cut before. Many of the trees were chestnut, and we know that this genus sends up shoots the next season after the parent tree is felled, hence we were enabled to calculate with accuracy the age of the trees. I think very few trees make a distinct second growth in the same season."

I quote the above passage from Friend Foster's letter in order to present both sides of this interesting subject, for the example cited is certainly a very striking one in the argument to sustain the one ring theory. But he, immediately after, in the same letter, helps the other side by a statement which is just as strong, if not more conclusive, for the second growth hypothesis. He goes on to say: "Young pear stocks *do make a second growth* as I have in thousands of cases seen. The seedling or sucker, as the case may be, if cut off within a foot or fifteen inches of the ground and then transplanted, after growing rapidly say a month or six weeks forms a terminal bud, which after a little period of rest pushes again, sometimes as late as September, the sap flows a second time, and inoculation may now be accomplished if it had been neglected during the first flow of sap."

This last statement shows, in a most conclusive manner, that a second growth may, and does take place in our exogens of this latitude. I hope to show in a future article that, in regions of no frost, this is still more frequent. We see by Mr. Foster's statement, that so far as the pear tree is concerned, the occurrence is by no means abnormal. I have reason to believe that it is frequent in other genera, and, though usually the second ring is less distinct than the first, yet in some cases it is quite as prominent.

O. R. WILLIS.

§ 125. **Virescence in Leontodon.**—My attention was attracted to-day to a sickly-looking, malformed specimen of *Leontodon autumnale*, in which all the heads were green. Examination shows the florets to be constructed about as represented in the accompanying sketch. The corolla is ligulate and exhibits its normal dentation, but is green in color. In place of the usual tawny pappus there is an indefinite number of laciniate green expansions, interesting perhaps as showing from reversion what may be the morphology of pappus. The androecium appears normal. The pistil, however, is quite changed, the usual filiform style being much thickened and the branches aborted to the two teeth shown in the figure. In several florets I detect what appears to be phyllody of the ovule. I have specimens in alcohol for further investigation.



Brown University, Sept. 30, 1881. W. WHITMAN BAILEY.

§ 126. **Note on Ilex opaca,** Ait.—I found this plant in a dwarf state last summer at Rockaway beach. I also saw it on the Navesink Highlands in abundance, and every specimen that I examined showed signs of winter-killing at the top. The head had evidently been damaged by frost every successive winter during the life of the plant. I have a specimen growing on my lawn, which for twelve successive winters has been killed at the top, up to last winter, when it lost its leaves, but the head did not die; yet the temperature fell lower than in any previous winter for the last twenty years. The thermometer indicated a temperature ranging from five to fifteen degrees below zero for several successive days.

White Plains, Oct. 13, 1881. O. R. WILLIS.

§ 127. **A white-fruited Blackberry.**—In the eastern part of Dutchess County, N. Y., there is a large, rocky, wild and uninhabited tract of land, elevated about five or six hundred feet above the valley below. The adventurous hunter and enthusiastic naturalist are about all that traverse this region. In the summer of 1879, whilst crossing this tract, I found growing a specimen of *Rubus villosus*, Ait., with white ripe fruit, as sweet and as pleasant to the taste as the black berries of the same species. The plant was apparently as vigorous as its normal neighbors which grew quite sparingly in the same locality. The foliage had that lighter color so common to plants that have become white-flowered. I carefully removed the bush to the garden of a farmer, who gave it kindly care, and it has since flourished, bearing its white fruit each season. I also sent some of the seeds to Mr. Chorlton of Staten Island, who planted them, and who will, in due time, report whether they reproduce their albino parent.

About twenty-five or thirty miles northeast from the place that I have mentioned is Mount Riga, on the border of the State of Massachusetts. On this mountain, about a thousand feet in height, I also found a single specimen of the white-fruited *R. villosus*. I have heard that persons in search of berries occasionally find, in this locality, similar plants. If this be true, these ridges must favor the growth of this peculiar variety.

G. M. Wilber.

§ 128. **Flowering of Plants in Autumn.**—About the first week in July of the past summer, I visited the province of New Brunswick. In botanizing about the capital city, Fredericton, which is about sixty miles inland, I was impressed with the curious mingling of early summer and autumn flowers. In the same field would be seen, in blossom, *Leucanthemum vulgare*, *Ranunculus acris* in profusion, and several solidagos and asters. The short summer of the region seems to crowd the seasons together; "spring and autumn here dance hand in hand."

The above note suggests a similar topic. As the autumn advanced here, in Providence, R. I., my four-o'clocks (*Mirabilis Jalapa*) bloomed regularly in the morning, from six to seven o'clock to ten or thereabouts. The morning-glories bloomed in the afternoon. On the now famous "yellow" day, or dark day, as it is called, I am told that sunflowers in this neighborhood were blighted. I cannot substantiate the statement, which is curious if true. Did any one note the nyctotropic conditions of leaves at that time?

Oct. 12, 1881. W. W. Bailey.

§ 129. **An Adventive Grass.**—Towards the end of last August, the Rev. E. E. Butler of Easton, Pa., collected in a wild ravine near Dobb's Ferry, N. Y., where it grows in considerable abundance, a grass which proves to be *Festuca gigantea*, Villars—another addition to our long list of plants introduced from Europe.

Thos. C. Porter.

§ 130. **Note on Salicornia.**—As my observations of *Salicornia herbacea*, L., and *Salicornia mucronata*, Lag., differ so materially from the descriptions given in Wood's Class Book of 1867, the only botanical work to which I have access, I will, although but an amateur botanist at most, endeavor to make a few remarks thereon. Instead of the *herbacea* flowering in August and the *mucronata* in September, as stated in the foregoing work, I find the *mucronata* now (August 8th) in full bloom, while the *herbacea* perhaps will not blossom till September. Instead, also, of the *mucronata* turning red, as stated in the above-named work, (while no such thing is mentioned of the *herbacea*), I found about the 25th of September last that the spikes of the *herbacea* were generally of a deep red color throughout, while the *mucronata* was tinged but slightly, or sometimes not at all. Instead, also, of Long Island being the southern limit of the *mucronata*, as stated by Wood, I find it growing in this county as mentioned in my communication in the BULLETIN of June last.

Messongo, Accomac Co., Va. ELLIS MEARS.

§ 131. **New New York City Stations.**—An hour's exploration of Croton Point on the Hudson River, in company with Dr. A. K. Fisher, on July 24th last, revealed the following interesting plants, most of which give a rather southern character to the flora:

Anemone cylindrica, Gray. A group of fruiting plants growing in sandy soil near the shore. Heretofore there seems to have been no authentic record of the occurrence of this plant within the limits of the Torrey Club Catalogue;

Tephrosia Virginica, Pers.; *Lupinus perennis*, L.; *Cornus circinata*, L'Her.; *Eupatorium sessilifolium*, L.;

Verbena angustifolia, Mx. I do not think that this plant has before been reported within the limits of our Catalogue north of New York City, but it was found at several places on Croton Point. I found a single plant in July at the locality, near King's Bridge, discovered several years ago by Mr. Leggett;

Teucrium Canadense, L.; *Onosmodium Virginianum*, DC., a single plant; *Pycnanthemum clinopodioides*, T. & G., a narrow-leaved form, seeming to approach *P. Torreyi*, Benth.; *P. linifolium*, Pursh.; *Asclepias obtusifolia*, Mx.; *A. verticillata*, L.; *Salsola Kali*, L.; *Cypripedium acaule*, Ait.; *Zizania aquatica*, L., abundant and conspicuous near the shore; *Tricuspis seslerioides*, Torr.; and specimens also of *Solidago arguta* were found in full flower at this date.

E. P. BICKNELL.

§ 132. **Botanical Literature.**—*The Botanical Collector's Handbook.* By W. Whitman Bailey, B.P., Olney Professor of Natural History (Botany) in Brown University, pp. 140. George A. Bates, Salem, Mass.—This work, of which we gave a prospectus in our March number, has at length made its appearance, forming No. 3 of the neat and useful publications which are from time to time being issued by Mr. Geo. A. Bates, under the title of "Naturalists' Handy Series."

That the "want of a manual," to use the author's words, "such as exists in other countries for the guidance of botanical collectors and amateurs, has long been felt in our own," was well shown by the large number of orders which, we are informed, were received for the Handbook, from all sections of the country, months previous to its publication. After a careful perusal of the work, we take pleasure in stating that it fills the long-existing hiatus in our botanical literature in a manner which reflects great credit on both its author and its publisher, and in a manner, too, which cannot prove otherwise than satisfactory to the large number who will have occasion to consult its pages for their guidance.

In writing the Handbook, Prof. Bailey has not relied entirely upon his own long experience as a collector, but has sought and obtained the aid of other workers who are prominently known in their several specialties. For example, Mr. Charles Wright has contributed an article on the preparation of *Cactaceae*, etc.; Mr. Thos. P. James has furnished directions for the collection and preservation of mosses; Prof. Edw. Tuckerman has given the result of his experience in the preparation of lichens ; Rev. Francis Wolle has furnished notes on the collection and preservation of fresh-water algae ; and Mr. Chas. H. Peck has contributed an entire chapter on the subject of collecting, preparing and mounting fungi, while instructions for gathering and mounting marine algae have been gleaned by the author from the writings of Profs. Eaton, Harvey and others. The notes of these various collaborators, along with those of the author on herborizing, fill the first three chapters of the book, the remaining ones being devoted to the subjects of: 'Closet-Work;' 'The Herbarium;' 'Bibliography;' and 'Public Herbaria.'

The book is well written throughout ; the directions are plainly and concisely expressed ; the copious illustrations are well executed; and the work, while it should find a place in the library of every working botanist, must prove especially valuable to that large class of beginners and amateurs who have hitherto been seeking in the dark for just such instruction as is here given within so small a compass and at so low a price.

Nova Scotian Fungi by J. Somers, M.D. In this pamphlet, kindly sent us by the author, are enumerated the names of 81 species of fungi collected during the year 1880 in the vicinity of Halifax. This list is a continuation of an enumeration published in Vol. v of the Transactions of the Nova Scotia Institute of Natural Science.

Catalogue of the Phaenogamous and Vascular Cryptogamous Plants of Indiana. By the Editors of the *Botanical Gazette* and Prof. Charles R. Barnes. 8vo. pamph. pp. 38. Crawfordsville, Ind.—The completion of this catalogue, which has been issued during the year in the form of extra sheets to the *Botanical Gazette*, gives us the most perfect enumeration of Indiana plants (exclusive of other than the vascular cryptogams), that has ever been published. The number of species enumerated is 1,432, which embraces only those plants whose occurrence the authors were able to authenticate by specimens, it having been the very commendable plan, rigidly adhered to from the outset, to admit the name of no species on hearsay. The catalogue is preceded by an account of the botanical and topographical features of the State, and by a very convenient outline map showing the location of the counties.

Trimen's *Journal of Botany*, for October, contains the following articles: 'On the Natural Order *Taccaceae*,' by H. F. Hance; 'On *Erythraea capitata* Willd., var. *sphaerocephala*,' by F. Townsend; 'On the Production of Hybrids in the Genus *Epilobium*,' by R. A. Briggs.

§ 133. **Proceedings of the Torrey Club.**—The regular monthly meeting of the Club was held Tuesday evening, Oct. 11th, at the Herbarium, Columbia College, the President in the chair and twenty members and two visitors present.

Plants Exhibited.—Mr. Leggett presented specimens of *Tsuga Caroliniana*, Englem., from the Carolina Mountains (Caesar's Head, Greenville Co., S. C.), sent by Capt. J. Donnell Smith, and spineless leaves of *Ilex opaca*, Ait., from South Carolina. Dr. Newberry exhibited a beautiful collection of Western plants collected by him on a recent trip through Colorado and Idaho, and also remarked upon the characteristics of the Western Coniferae. Mr. Gerard exhibited a specimen of *Richardia Æthiopica*, the spadix of which was subtended by three spathes, sent by Miss Palmer from Louisville, Ky. Prof. Schrenk showed specimens of plants collected by him in New Hampshire during the summer, and placed them at the disposal of the members present.

Hybrid Oaks.—Mr. Britton remarked upon some singular forms of hybrid oaks found by Mr. Rudkin and himself growing in abundance at Keyport, N. J., and which are now under investigation with a view of determining, if possible, the parent species. A series of leaf specimens was shown exhibiting various transitional forms, apparently between *Quercus Phellos*, L., and *Q. nigra*, L.

Serratula tinctoria.—Specimens of this adventive plant, which has become pretty well established in a few places on Staten Island, were sent by Mr. Wright from West Brighton, for the Club's inspection.

Polyphylly.—Mr. Bicknell reported the detection by him this season of a plant of *Asclepias Cornuti*, Decaisne, having its leaves in whorls of three, and also of a plant of *Silphium perfoliatum*, L., with leaves in whorls of three and with a 6-angled stem. Mr. Britton remarked that he had observed precisely the same change this year in specimens *Eupatorium teucrifolium*, Willd.

Suppression of Leaflets in Carya.—Mr. Britton showed leaf specimens of a trifoliate form of *Carya porcina*, Nutt., detected in New Jersey, and stated that all the leaves on the tree whence these were taken exhibited the same suppression of the usually two or four additional leaflets.

New Stations.—Mr. Bicknell read a list of new stations for plants belonging to the City's flora. Mr. Rudkin gave White Mills, New Lots, Queens County, as a station for *Tripsacum dactyloides*, L., a plant not reported as belonging to the State flora, and exhibited specimens gathered at that locality.

One person was elected an active member, and two names were proposed for membership.

BULLETIN
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Vol. VIII.] New York, December, 1881. **[No. 12.**

§ 134. The Fertilization of Scrophularia.

By WILLIAM TRELEASE.

If one might judge from the number of published accounts, the process of pollination in all its details should be, in few genera, better known than in that which forms the subject of this note. Unfortunately, however, the student who compares these accounts finds that they differ greatly among themselves, while not a few fail to agree with what he observes for himself in studying the plants. For this reason it has been thought not unprofitable to combine an account of some observations made during the past three years by the writer, with a critical summary of the literature that he has had access to. Unless otherwise stated, what is said relates to *S. nodosa*, L.

The tube of the irregular gamopetalous corolla is inflated approximately to a sphere (Figs. 1 and 4), its limb projecting from the somewhat constricted mouth. The bilobed upper lip and the lateral lobes of the trilobed lower lip project straight forward, giving the flower some resemblance to the old-fashioned poke bonnets one occasionally encounters in country places; while the middle lobe of the lower lip is reflexed and closely applied to the outside of the tube. This structure, and the color, inconspicuous though it be, of the corolla, lead us to believe the flowers zoophilous, a belief strengthened by the fact that nectar is abundantly secreted from the expansion of the flower until some time after fertilization has been effected. The organ which secretes this fluid is an irregular annular disk which surrounds the base of the ovary (Figs. 2 and 3). Commonly, but not invariably, it is more prominent on the upper side; and unless the quantity of nectar is very great, it collects in one or more drops at the upper side of the ovary, though it has occasionally been found in sufficient quantity to fill the basal part of the corolla.

When a flower is about to open, its style will be found bent upward, the already mature stigma lying against or close to the top of the corolla, while the four immature stamens are crumpled down into its base, near the ovary. When the flower has opened, these organs retain essentially the same position, the style being so curved that the stigma lies just below the middle of the mouth of the corolla (Fig. 2). In this state the flower is functionally pistillate. After a varying period, depending largely upon the temperature prevailing at the time, the stamens begin to appear at the mouth of the corolla, successively taking their places close to the base of the reflexed lobe of the lower lip, and shedding their pollen. A considerable number of observations show that the inner (or lower) pair matures first, in some cases the one on the right appearing first; in others, that on the left. If, as is constantly the case in pleasant weather, when the insects which will be shown to visit the flowers are most active, the stigma has been fertilized before this, its style will have bent downward and become closely appressed to the reflexed lobe of the corolla (Figs. 1 and 4); but in case no pollen has reached it, it will have moved little, and the relative position of the parts will be that shown in Fig. 3, where one pair of stamens is mature. In the former case the plant will be functionally staminate; in the latter, perfect. The species is, therefore, protogynous, as first noted by Sprengel (1. p. 323[*]). Ricca (1, p. 261) notices the reflexion of the style, supposing it merely a preventive of close-fertilization.

Theoretically, there should be five stamens in *Scrophularia*, but as a general thing only four are found, attached to the corolla near its base, the fifth being represented by a small truncate or notched scale adnate to the corolla just below the point of union of the lobes of the upper lip. That this body represents the missing stamens is shown by its position and occasional development into a poliniferous organ (Müller, 1, pp. 281–2). A natural question as to the reason for the common abortion of this stamen finds a ready answer in the mode of pollination. The stigma, and the anthers of the developed stamens lie at the bottom of the opening into the corolla, just where they are most efficient when the flower is visited for nectar by an insect; for the latter, occupying the same relative position on all flowers visited, brings the same part of its body into contact with the mature organ, be it stigma or anther. Were the fifth stamen developed, it could be of no use while occupying its normal position, since its pollen would always be received by that part of the insect which never touches the stigma (Ogle 1, p. 51). The only alternatives are its suppression and its growth so as to lie with the others, at the lower side of the flower. The latter bringing the filament obliquely across the cavity of the flower, and obstructing it to a certain extent, even though the filament were closely applied to the side, is less practicable than the former, which, accordingly, Nature has adopted. Were it entirely useless we should expect it to be removed *in toto*; but the fact that a remnant constantly occurs, though differing greatly in size in the different species of the genus, leads us to look for some useful purpose that it serves. Sprengel (*l. c.* p. 322) saw in it a means of arresting any stray rain drops that might have crept under the rim of the bonnet, for he saw clearly that, for some reason, there is almost always a provision in nectariferous flowers for

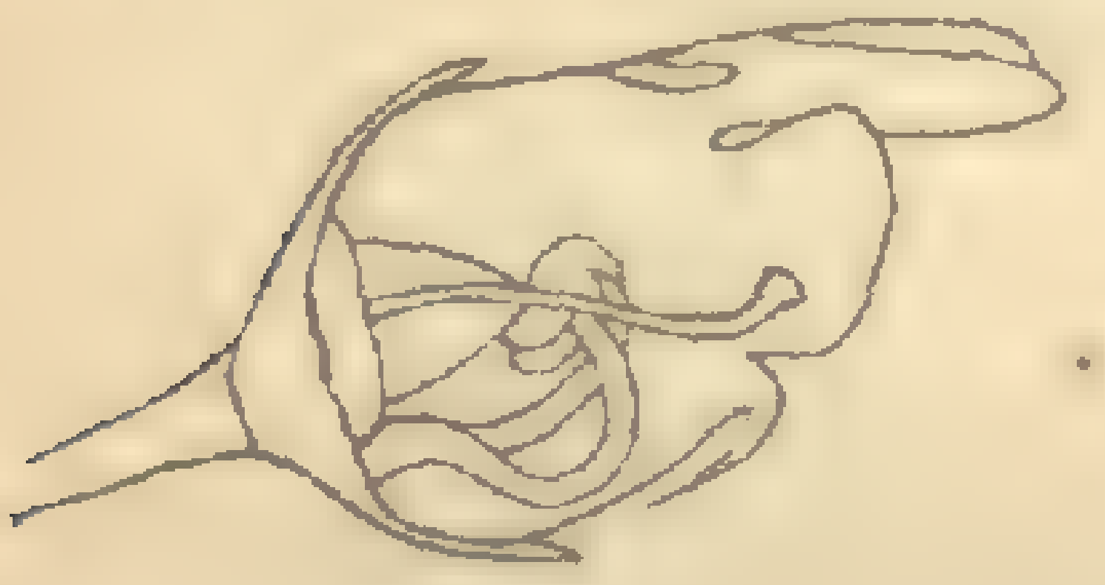

Fig. 2.

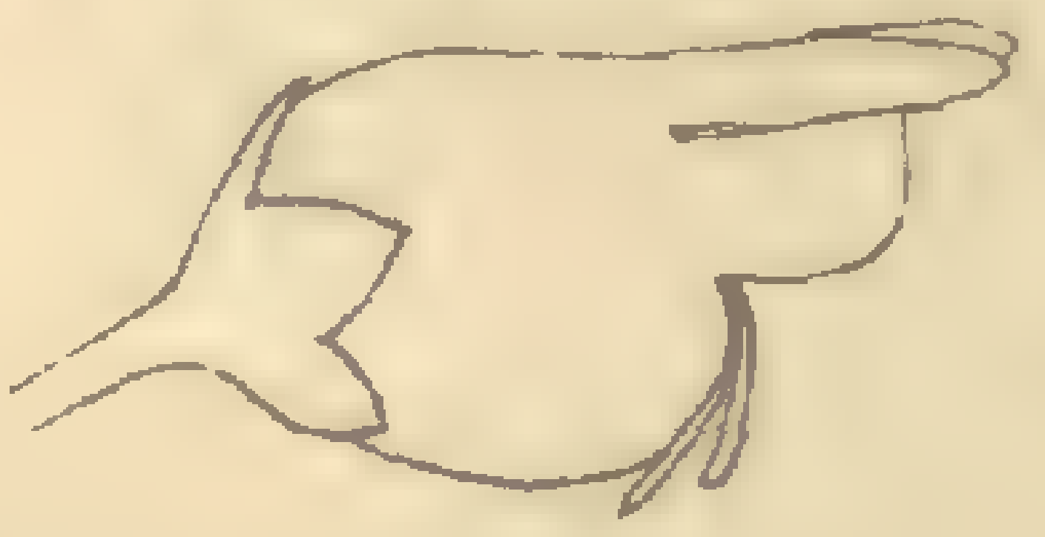

Fig. 1.

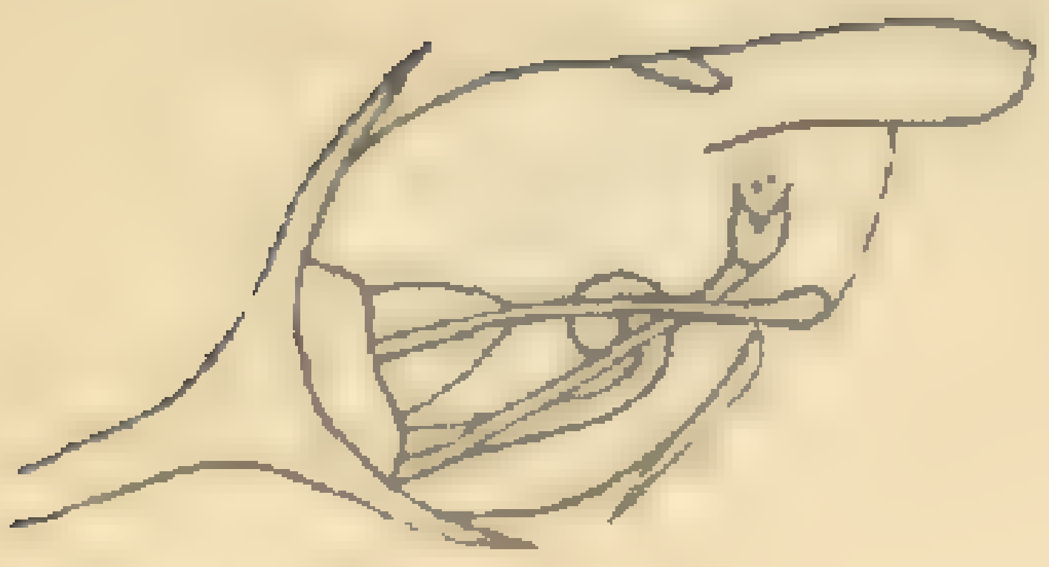

Fig. 3.

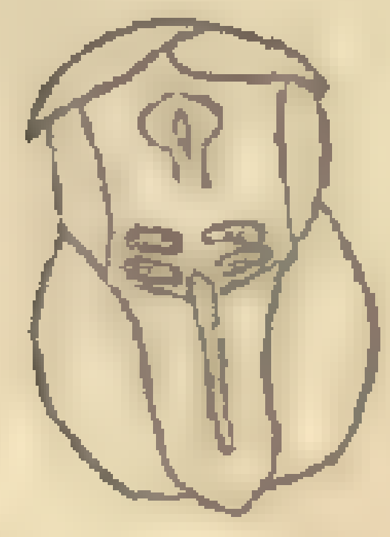

Fig. 4.

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[*] Where references are made as here, the first numeral indicates the book or article similarly numbered under the author's name, in the list at the end of this article.

protecting their honey from dilution by rain.* While, as he showed, the scale serves to a certain extent as a nectar-guard, its chief use appears to be that of guiding insects which visit the flowers so as to force them to enter all in precisely the same manner. This thought was first suggested by the longitudinal furrow on the lower side of the scale, the two sides projecting downward as far as their width permits. In this form it renders it far easier for insects to enter bodily or insert their heads immediately over the middle line than at either side. The position of the grooved scale, opposed to the sexual organs to which it serves as a guide, corresponds precisely to that of the guiding groove found in *Labiatae*, orchids, etc., and the very slight development of this body in some species is no stronger argument against this view of its function than the slight development of the guiding groove of some plants in the orders just mentioned is against its usual function when well developed. An interesting fact, first observed last spring, is that soon after fertilization has been effected and the stamens have shed their pollen, a slight jar causes the corolla to break loose from the receptacle; immediately after which the calyx begins to close, forcing the corolla off much as in *Verbascum* and *Veronica*. Several times, I saw this brought about by the visit of wasps belonging to the genus *Eumenes*. Finding itself, and the corolla to which it clung, suddenly removed from the nectar it was after, appeared to be matter of much surprise to the wasp, which visited no more flowers on that plant. This phenomenon doubtless aids in securing the crossing of the different plants, in the genera in which it occurs. So far as made out, the process is quite similar in the three genera named; though whether it is to be attributed to irritability or not is a matter about which opinions differ. In *Rhinathus major* and *R. minor* the corolla is also deciduous; here it does not fall from the receptacle, but tears across near the base, as stated by Rossmann (*Bot. Zeitung*, 1860, p. 217).

The inconspicuous lurid flowers, with but a faint variation of color pointing to the nectar, and their unpleasant odor, are less attractive to bees† than to wasps, and it is upon these insects that the flowers chiefly depend for their cross-fertilization. Sprengel states that he has seen a large and a small wasp collect nectar from *S. nodosa* (*l. c.* p. 324). H. Müller found the most frequent visitors for nectar to be *Vespa vulgaris*, *V. rufa*, *V. Germanica*, *V. media*, and *V. holsatica*. In smaller numbers he found the following bees: *Bombus agrorum* (once), *Halictus sexnotatus*, *H. zonulus*, *H. flavipes*, (1, p. 283). The same observer records *Bombus senilis* as also visiting the flowers for nectar (2, p. 267). Darwin speaks of the flowers of *S. aquatica* as being fertilized by wasps (1, p. 176; 2, p. 147)

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* The notion formerly was that nectar, being less attractive to insects after dilution, was protected from the rain by these devices. Since, however, the osmotic nature of the secreting process seems probable, it is likely that the necessity for maintaining a dense syrup on the surface of the gland is the principal reason for the existence of these nectar-guards, though the reason first mentioned is undoubtedly of considerable importance. Some remarks on this subject may be found in the *Botanical Gazette* for Nov., 1881, p. 287.

† [illegible] as a [illegible] "honey-plant"! See [illegible] in Amer. [illegible] on bees.

Prof. Farlow saw only hive-bees collect nectar on *S. nodosa* (Gray, 1, p. 151). Meehan finds *S. canina* visited by "small sandwasps and other winged insects" (1, 108). Dr. Gray states that *S. nodosa* is visited by hive-bees (2, p. 111; 3, p. 36; 4, p. 220); and Darwin quotes this statement (3, p. 424). Wilson observed a wasp while collecting nectar from *S. nodosa*, and quotes Müller and Darwin on the visits of wasps to this species and to *S. aquatica* (1, pp. 565–6). Delpino finds wasps on the flowers in Italy (1, p. 212), and Lubbock also speaks of their visits (1, p. 137). Finally I have observed *Eumenes fraterna* and *Odynerus albophaleratus* collecting nectar from the flowers several times in New York, New Jersey and Wisconsin, and small bees belonging to two or more species of *Halictus* were occasionally noticed similarly employed. The former cling to the flower, inserting only their heads, as Sprengel and Müller have shown to be the case with the larger wasps; the latter creep bodily into the corolla. Both are forced by the shape of the corolla and the presence of the arched fifth stamen to enter in the median line. The nectar is also attractive to certain large ants, which, were they more active, would give efficient aid in the transfer of pollen from flower to flower; their sluggishness, however, renders their services of little value and, as they seldom travel from plant to plant, the crossing they do effect is merely between flowers of the same stock. The flowers are also sometimes visited for their pollen; Sprengel found "ein Insekt welches eine Aehnlichkeit mit einer Biene, und auch einen Stachel im After hat, aber viel kleiner ist, als eine Biene" (probably a *Halictus*) engaged in collecting pollen from *S. nodosa* (*l. c.* p. 324); Müller saw *Halictus sexnotatus* employed in the same manner; and near Madison I had an opportunity to watch a species of the same genus as it collected pollen. From the above statements it appears that the nectar of *Scrophularia* is attractive to wasps, bees, and ants, principally the first-mentioned; and there is every reason for believing that the entire genus is adapted to profit especially by the visits of these insects, which appear to find the nectar more palatable than do bees. As in *Symphoricarpus racemosus* and *Ribes Cynosbati*,* which are also largely visited by wasps, and also have corolla tubes of comparatively little depth, *Scrophularia nodosa* is occasionally perforated (Sprengel, l. c., p. 324), and here, as there, the depredator is, no doubt, one of the larger species of *Vespa*, though direct observation has failed to discover its identity, as yet.

Sprengel saw that insects must transfer pollen from older to younger flowers while gathering nectar, and that the result was crossing, and not close-fertilization; and most later observers agree with him. Mr. Wilson is, however, the first who has tried to show how the inconspicuousness of the flowers and the *proterogyny* are of value to the plant (1, p. 565), both being correlated with the adaptation of the flowers to *wasps*, these partly predaceous insects being enabled by their acute senses to discover inconspicuous objects with little difficulty. Mr. Wilson believes, and rightly, that a flower adapted to fertilization through their agency can reach its highest perfection only when, being easily discernible by them, it is as little attractive as possible to other insects. The color and odor of the flowers of *Scrophularia*, and the quality of their nectar evidently tend to this end. The same observer, watching a wasp on *S. nodosa*, found that the first flower on the stem which it visited was the top one; from this it passed to the others in a somewhat irregular manner going downwards, and finally left the plant from the lowest flower (*l. c.*, p. 565). This procedure was said to bring the insect first to the younger, pistillate flowers; then to the older, staminate ones. My own studies show a very great irregularity in the visits of wasps, but this irregularity is largely conducive to cross-fertilization in its widest sense. So far as I know, the insects which visit the flowers for pollen go only to those whose anthers are dehiscent, and can have little influence in effecting pollination, except in cases where the stigma is still unfertilized when the stamens begin to mature.

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* BULLETIN TORREY CLUB, June, 1881, pp. 68–9.

So far as may be judged from reliable statements, and from personal observation, *Scrophularia* is therefore perfectly adapted to cross-fertilization by the aid of insects, and the favored visitors are wasps. Sprengel could not believe that if, as Kölreuter and Medicus insisted, fertilization was intended to be effected by the successive rising of the stamens and their bursting beside the stigma, the flowers would remain merely pistillate for some two days before the stamens came up to fertilize them. He went, however, to the other extreme, believing that fertilization has always occurred, and the style becomes reflexed before the anthers dehisce, self-fertilization or close-fertilization by any means being thus excluded. Henschel, though far from a believer in Sprengel's views, found that before the anthers of *S. Scorodonia* and *S. glandulosa* had come to maturity the style was reflexed (1, p. 103). Dr. Müller was the first to show that *Scrophularia* is far better fitted to maintain existence than its adaptation for cross-fertilization alone implies; for he found that, as has been stated in describing the order of maturity of the organs, if unfertilized—and this frequently occurs in damp, cold weather, when insects are least active in their visits—the stigma remains in its position until the stamens mature, and so, in a sense, the belief of Kölreuter and Medicus is realized. This fact is of easy observation, and no doubt accounts for the similar belief of Mr. Meehan whose keen eyes detected insects upon the flowers of *S. canina*, but could find no pollen upon the stigma of a flower until after the dehiscence of its own anthers. Henslow (1, p. 371), with a strong predisposition to see adaptations for regular self-fertilization, comes to the same conclusion from a study of dried specimens of this species, and finds his belief confirmed by what Mr. Meehan saw. Dr. Gray, like Sprengel, looking at the matter from another standpoint, seems to have overlooked the provision for regular self-fertilization in case crossing has not occurred, though it is to him that we owe the interpretation of Nature's golden rule to flowers: "get fertilized, cross-fertilized if you can, self-fertilized if you must, but at all events get fertilized." Speaking of *S. nodosa* he says: "self-fertilization here can hardly ever take place, and only through some disturbance of the natural course" (4, p. 220); a similar statement is also made in

2, p. 111. From flowers which, if not crossed, are self-fertile, it is but a step to such as are regularly self-fertilized, but with a possibility for occasional crossing; and a step further leads to cleistogamous flowers, incapable of crossing, and constantly self-fertilized. It is a significant fact that the latter are never produced to the exclusion of others capable of being crossed, their occurrence under any circumstances being merely a sure means of securing some offspring with as little drain as possible upon the system of the plant.

Through the kindness of Mr. Watson, I have been able to examine the specimens of *Scrophularia* in the Gray herbarium, with the following results. So far as could be judged from dry specimens, protogyny with the characteristic relations of stamens and pistil found in *S. nodosa*, occur in *S. aquatica*, *S. bicolor*, *S. callantha*, *S. canina*, *S. chrysantha*, *S. floribunda*, *S. glabrata*, *S. grandidentata* (?), *S. hirta*, *S. Hispanica*, *S. incisa*, *S. laciniata*, *S. mellifera*, *S. multicaulis*, *S. Oliveriana*, *S. peregrina*, *S. racemosa*, *S. sambucifolia*, *S. Scopolii*, *S. Smithii*, *S. sylvatica*, *S. tricopoda*, *S. trifoliata*, and *S. variegata*. In all of these, crossing appears well provided for, while the position of the parts in some flowers of several species render it probable that self-fertilization is possible, later, if this has not occurred. No species were found in which there was reason to believe that synacmy and regular self-fertilization occur; but in a considerable number the specimens did not allow an opinion to be formed. Cleistogene flowers were found only in *S. arguta*, where they were first detected by Durieu de Maisonneuve in 1856 (1, p. 569), and later mentioned by Kuhn (1, p. 67); and it is needless to say that open entomophilous flowers occur on the same plants, although the specimens do not allow me to state whether dichogamy is present or not.

Before closing, reference must be made to several conflicting statements about the sort of dichogamy found in this genus. As stated before, Sprengel found that the pistil matures before the stamens; this and *Euphorbia* being the only genera known to him as possessing what he called "weiblich-männliche Dichogamie." Axell (1, p. 39) doubts this without having studied the plant; but Hildebrand (1, p. 21), Müller and others have no difficulty in finding this state of things which we call to-day protogyny, and I know of no statement implying the reverse, saving that by Prof. Beal (1, p. 202), which is a slip as shown by the context. Mr. Pryor makes the following statement about *S. aquatica* which at first seems unintelligible: "The anthers may be seen (*a*) projecting some distance above the lower lip of the flower, while the style is still undeveloped, and concealed some way down in the tube. In other cases (*b*) the stamens and styles alike have risen, but not to the same extent as in *a*, above the level of the surface; while in a third instance (*c*) the anthers are barely visible, but the greatly lengthened style is closely reflexed over the lower lip of the corolla, and indeed almost reaches the upper border of the sepals. Are these several changes only the result of growth, or is there anything like trimorphism in these plants? More probably, perhaps, as in case of some of their nearest allies, they are regularly protandrous, and these appearances would thus find a ready explanation" (1, p. 259). Stages *b* and *c* are readily understood, being nearly what we show in figures 3 and 4, their order of succession being reversed. Mr. Pryor appears to have entirely overlooked the first stage, shown in figure 2, and his *a* is an abnormal state of things which the writer has seen a number of times, the style being dwarfed and the stigma usually incapable of fertilization. When such cases are seen on the living plant it is very easy to convince oneself that such styles never elongate so as to give rise to *b* and *c*.

As to the organ which secretes the floral nectar, mention is made of it in many of the essays and theses on "nectaries" which were the fashion fifty to seventy-five years ago, the usual statement being that the glandular organ is the disk described above. This view is also held by Sprengel, Müller and Delpino; the latter, however, considering it a part of the ovary rather than of the receptacle (1, p. 93). Dr. Gray (1, p. 151) states that "the nectar sought by insects is here secreted abundantly by the corolla, at its base at the posterior side, and to some extent by the disk which girts the base of the ovary; the posterior face of the scale which represents the anther of the fifth stamen is apparently glandular, but hardly if at all nectariferous." That the corolla takes any part in the secretion appears to require further demonstration.

If, as we hope is the case, the conflicting statements concerning *Scrophularia* have been reconciled, it remains only to state in summary: 1, that the flowers (taking *S. nodosa* as the type) are adapted by their coloring, odor, nectar,form and protogyny to cross-fertilization by wasps; 2, that in case the insects fail to do their part, self-fertilization is fairly well assured, though we have known it to fail occasionally; 3, that the existence of species which are adapted to close-fertilization without a previous chance for crossing remains to be proved; 4, that cleistogene flowers are produced, so far as we know, by only one species, *S. arguta*.

DESCRIPTION OF THE FIGURES.—Fig. 1, old flower in the staminate stage, x 2. Fig. 2, newly-opened flower in the pistillate stage, the nearest side of the calyx and corolla being removed, x 2. Fig. 3, unfertilized flower in which the inner stamens are maturing, the nearer side of the calyx and corolla being removed, x 2. Fig. 4, old flower in the staminate stage, seen obliquely from in front, x 1½.

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§ 135. A New North American Lichen.

By H. WILLEY.

Mr. C. G. Pringle, who in the past two years has added to our knowledge of the Lichen Flora of Northern New England and Lower Canada, last spring collected in Arizona, some lichens, among which there is one that is new and particularly interesting.

This lichen, for an inspection of the specimen of which I am indebted to Charles J. Sprague, Esq., of Boston, was collected in the Santa Rita Mountains, Arizona. It belongs to the genus *Omphalodium*, and is considered by Prof. Tuckerman to be a subspecies of *O. Hottentottum*, (Thunb.), and is to be distinguished as

O. Hottentottum, var. ARIZONICUM, Tuck., ined. The genus belongs to the family Umbilicariae, and is distinguished from *Umbilicaria* by the thalline margin of the apothecia, on which account *O. Hottentottum* and the only other species, *O. Pisacomense*, May. & Fl., a South American lichen, are referred by Nylander to *Parmelia*. *O. Hottentottum* is a rather rare Cape of Good Hope lichen marked by the ciliate margins of the thallus and of the apothecia; though this character is not constant.

In var. *Arizonicum* the lobes are more rounded and crenate than in *Hottentottum*; the upper side is smooth and greenish-glaucescent, the under side fuscous-black, naked, smooth at the centre, and becoming lacerate in anastomosing ridges towards the circumference. The apothecia are numerous, scattered, at first concave, then plane, with an inflexed, entire or more slightly crenulate thalline margin, reaching 9mm. in diameter; the disk dark chestnut; the hymenium, which rests in the gonidial stratum, is pale; thekes inflated; spores in 8s, ovoid or elliptical, colorless, measuring from 11– to 15–thousandths of a millimetre in length and from 6 to 9 in breadth. The spermogones are numerous near the margin of the lobes, black, more prominent than in *Hottentottum*; sterigmas simple; spermatia staff-shaped, 9- to 11-thousandths of a millimetre in length. Reaction of the hymenium from blue becoming vinous-red. Gonidia from 13 to 18 mmm. in diameter.

A thin section of the thallus shows it to be composed of a compact medullary tissue of longitudinal fibres, which pass perpendicularly to the surface on either side, the gonidial stratum being about one millimetre below the upper surface. After treatment with potash, sulphuric acid and iodine, the hymenium assumes a deep blue color, the hypothecium a pale yellow, and the internal contents of the spermogones a vinous-red, and the hyphae of the thallus become a pale blue, which is deeper when the section is of some thickness.

In the only fragment of *O. Hottentottum* which I have seen, the laciniae of the thallus are narrow and elongated, the upper surface is darker than in var. *Arizonicum* and the lower surface uneven but not lacerate, with stiff fibres at the margin, The apothecia are also ciliate and the margin is more inflexed than in the other. A thin section shows the structure to be the same in both plants, the inferior stratum being, however, somewhat narrower in *Hottentottum*; the gonidia all about 13mmm. in diameter. On the application of potash, the gonidial stratum becomes a bright red, a change which does not occur in var. *Arizonicum*. The spores in *Hottentottum* (seen only in the thekes where they often are smaller than when free) are like those of the other plant, but from 9 to 11mmm. in length. Reaction of the hymenium with iodine, blue. The hyphae of the lower stratum are continued into the solid fibrils.

It is curious that two other Cape lichens, *Parmelia molliuscula*, Ach., and *Pertussaria ambigens*, (Nyl.) Tuck., have also been found in the western regions, the one being not uncommon in the Rocky Mountains and the other occurring in Oregon.

§ 136 **Ballast Plants in and near New York City.**—I have found but little opportunity during the past season to continue the observation of adventive plants introduced with ballast, reported in previous numbers of the BULLETIN, (Vol. vii. p. 122). The principal grounds near Communipaw, containing the freshest deposits of ballast have been frequently dug over to destroy weeds, so that there was little chance for any mature growths. No new ballast has been brought there this year, and there are doubtless other places near New York where it has been deposited which if sought out and watched during the next few years would richly repay attentive observation.

The results of a few visits to the grounds at Communipaw Ferry are given below, with the names of several species which were collected in 1880, but omitted by mistake in last year's report. Many, if not most, of those previously reported continue to reappear where the ground is undisturbed. *Asperugo procumbens*, *Neslia paniculata*, and *Sisymbrium Irio* were found in considerable masses in places quite distant from where first found; and *Lepidium Draba*, exterminated where it had flourished several years, appeared from fresh seeds in another quarter.

In the following list, the plants not in Gray's Manual are printed in *italics* or in small CAPITALS, the latter designating plants not before reported here so far as known. The asterisk (*) indicates those not previously found within our local limits, the dagger (†), those found by Mr. Martindale or Mr. Parker near Philadelphia. The numbers are continued from the report of Dec. 1880. In No. 298 (Dec. 1880) erase "var. dentata."

†366. *SISYMBRIUM PANNONICUM, Jacq. 8th Avenue, July, 1880.
†367. Sisymbrium Thalianum, Gaud. Com. May.
†368. Lepidium ruderale, L. Com. May–June. The European form, with root-leaves (4′–6′) in a dense rosette, bi-pinnatifid, lobes linear, very slender and graceful.
369. *TRIFOLIUM OCHROLEUCUM, L. Com. May.
†370. *TRIFOLIUM LAPPACEUM, L. Com. Aug. 1 plant.
†371. **Hippocrepis comosa*, L. Com. May Flowers only. Scarce.
372. **Colutea arborescens*, L. Com. June. Wharf.
†373. **Bupleurum protractum*, Link. Com. June, 1880.
†374. **Caucalis* (Troilus) *infesta*, Curtis. Com. June.
†375. **Hemizonia ramosissima*, Benth. Com. July.
†376. *Matricaria discoidea, DC. Com. Aug. Western.
†377. *Tussilago Farfara, L. Com. May.
318. *CENTAUREA AUSTRIACA, Willd. Com. June. The same as last year called *C. Phrygia*, L., from which *C Austriaca* is distinguished by its three upper series of scales surpassing and not covered by the long recurved lower appendages.
†378. *WAHLENBERGIA LINARIOIDES, DC. Com. July, 1880. Chili.
379. **Gilia achillaefolia*, Benth. Gowanus, July, 1880, West.
380. **Amsinkia intermedia*, F. & M. Gowanus. July, 1880. West.
381. *VERBASCUM SINUATUM, L. Com. July, 1880.
†382. Roubieva multifida, Moq. Gowanus. Aug., 1880.
†383. CHENOPODIUM OBOVATUM, DC. Hunters Point. July, 1880.
384. *Euphorbia Esula, L. Com. Cct. 1880.
†385. Alopecurus geniculatus, L. 8th Ave. Aug.
386. *ALOPECURUS BULBOSUS, L. Com. Aug.

New York, Nov., 1881. A. B.

§ 137. **An Unpublished Letter of Wm. Darlington.**—By the courtesy of Robert C. Davis, of Philadelphia, who possesses the original, we are permitted to present our readers with the following letter, which, as part of a correspondence between two eminent botanists of a past generation, has much interest. We need not regret that De Candolle's genus *Darlingtonia* had to give place to Willdenow's *Desmanthus*, since this enabled Dr. Torrey to compliment his friend by naming for him the magnificent California pitcher-plant.

WEST CHESTER, Penn., Feb. 7, 1829.

DEAR SIR:—Yours of the 1st inst. was received this day, together with a *second* portion of the 5th Edition of your manual. By my Letter forwarded a few days since, you will perceive that I had previously received the *first* portion. I feel much indebted for your complimentary Letter; for, although the compliment is very extravagant there is such an air of blunt frankness about it, that I cannot help prizing it highly. I sincerely wish it was merited to the one-half of its literal extent. As to undertaking a work on the Botany of N. America, it is entirely out of the question, with me. I have, indeed, commenced a *Herbarium*, with a view to become acquainted with American Plants; and, if I live, mean to persevere until I possess specimens of our Plants, as far as possible. Should I be reasonably successful in the undertaking, I shall be happy to aid any gentleman in preparing such a work as you allude to, and which, I think, will ere long be much wanted. I hope some one will be prepared to attempt it, before a great while. I have been trying to persuade Dr. Torrey, for two or three years past, to undertake it; but his other engagements seem to prevent him, even from completing his Northern Flora. In the mean time, however, your manual will make a pretty good substitute, if you carefully introduce all the known plants into this 5th Edition.

You ask if I am rich, and at leisure? I am (whether fortunately, or unfortunately, I know not) neither the one, nor the other. I have a large family, with but little except a country practice of Physic, to maintain them, and a petty appointment of Clerk of our Court, which I hold temporarily. Of course, I have but little leisure to prosecute unproductive studies. I nevertheless take great delight in devoting what time I can seize, to my favorite pursuit of Botany; and, perhaps, do it with more zeal than I should do, if I was wealthy and disengaged. I am but about six years younger than yourself; and therefore have got rather past the time of life when I might have traversed the country, free from family clogs, in pursuit of Botanical treasures.

Agreeably to your request, I now send you what information I am possessed of, relative to Professsor De Candolle's genus *Darlingtonia*. It was first published, I believe, in the "Annales des Sciences Naturelles," in 1824, in a paper entitled "Notices sur quelques genres et espèces nouvelles des Legumineuses;" and soon afterwards, in his "Memoires sur la famille des Legumineuses," page 427; (Memoire 12, sous-ordre *Mimosees*,)—where he has these observations, which I give you in his own language.† * * * In addition to the above Dr. Torrey has described *D. intermedia*, in Annals of N. York Lyceum.

I have seen but one species of this genus; and that I have growing in my garden. I got it by the name of *D. brachyloba*, and it agrees exactly with the *figure*, in de Candolle's Memoires, but not with the *description*. There is some mistake about it, which, for want of possessing *all* the species, or supposed species, I am unable to clear up. The books all describe the *Legumes* of D. brachyloba, as *straightish* and lanceolate, (*rectiusculis*), whereas in De Candolle's *plate*, and in *my specimens*, the Legumes are quite *falcate*; precisely as those of *D. glandulosa* are said to be. I got my specimens from Bartram's old Botanic garden, where the plant has long been known by the original name of *Mimosa illinoensis*; and yet this discrepancy exists. Whether, or not, there is *really* more than *one species*, I am unable to say; and I think there is more information wanted, before that point can be determined, satisfactorily. The Plant which I have growing is I think, quite distinct from both Acacia, and Mimosa. It is, as D. C. observes, *Hermaphrodite*, or bears *perfect flowers*; and, having constantly 5 stamens, I believe ought to be placed in the class *Pentandria*. You will perceive that your *generic* description will admit of some amendment, as *few* seeded, instead of "many" seeded, &c.

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† We omit at this point a lengthy quotation from De Candolle.—Eds.

I observe a few *typographical* errors in the sheets last received from you; but as it will probably be too late to correct them, I will not trouble you now with enumerating them.

I am pleased to see, by last Silliman's Journal, that Dr. Beck is going to publish a work on our Ferns and Mosses. I have long wanted such a work, to enable me to study those plants with more success than I have heretofore had. I hope he will point out the *proper season* for investigating each tribe with most advantage. Be pleased to suggest to him to designate the month, or time, when the fructification of each plant is in the best state for examination, somewhat as the *flowering* of phoenogamous plants is usually noted.

I wish I could aid you in your *geological* researches, by remarks or otherwise, but I am too much of a *tyro* in that science to venture. It is quite a favorite subject with me, but I do not feel competent to offer suggestions on it at present. Excuse my tedious epistle.

Yours respectfully,

Prof. Amos Eaton, Wm. Darlington.
Rensselaer School, Troy, N. Y.

§ 138. **Malvastrum angustum in Illinois.**—I have found in this neighborhood *Malvastrum angustum* which was found by Engelmann and Parry on Rock Island, on a spot now covered with buildings. It was supposed to be extinct in Illinois. Wood does not recognize it. It was found late in the season, and I have only fruited specimens for exchange. Of these I can furnish a considerable number.

Ottawa, Ill. H. L. Boltwood.

§ 139. **Marsilia quadrifolia.**—The mention of this plant in the November number of the Bulletin reminds me that many years ago the late John L. Russell, of Salem, gave me a specimen of it, which he told me he had cultivated in his garden from plants procured by him at the original station. It is not unlikely that he also planted it in ponds in that vicinity, and that its occurrence there now is due to this propagation.

New Bedford, Mass, H. W.

§ 140. **Notes from Staten Island.**—*Rhus copallina*, L. This species, commonly known as dwarf sumac, is described by Gray as being from 1–7 ft. in height. I have commonly found it higher than that, and one individual, near the Church Road, Port Richmond, S. I., is full 25 ft. in height and towers considerably above the tops of *Carpinus*, *Cornus*, etc., with which it grows.

Viola cucullata, Ait. On Saturday, Oct. 22nd, I found this species in full bloom and with other buds in different stages of growth and development, near Richmond, S. I. On the following day I found several specimens of *Viola pedata*, L., near New Brighton, S. I.

Arthur Hollick.

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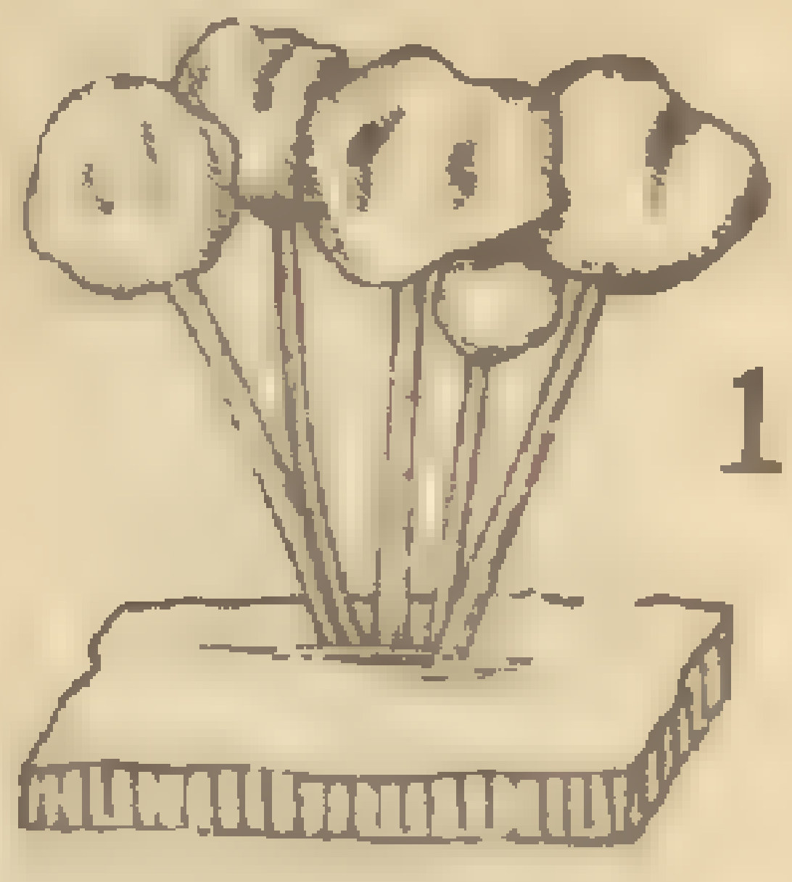
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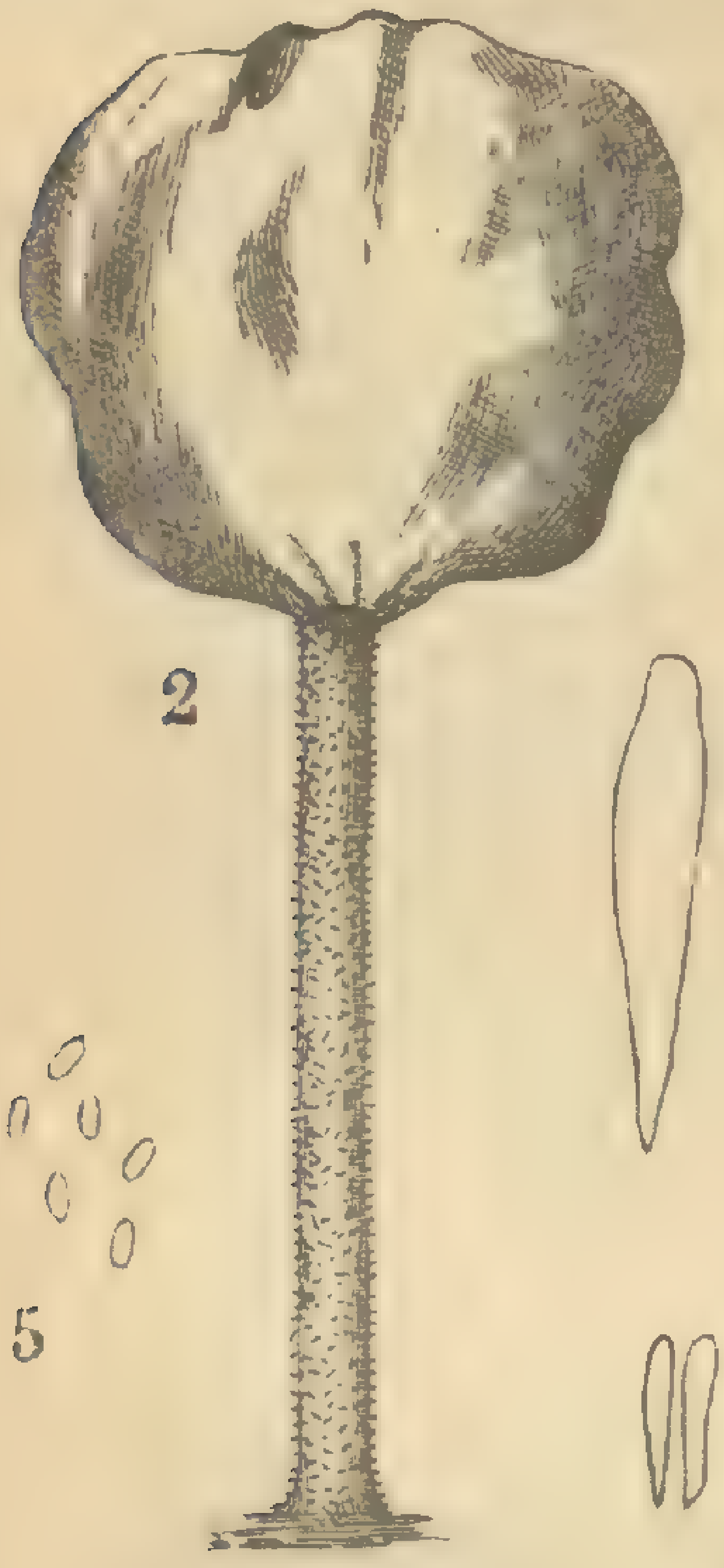
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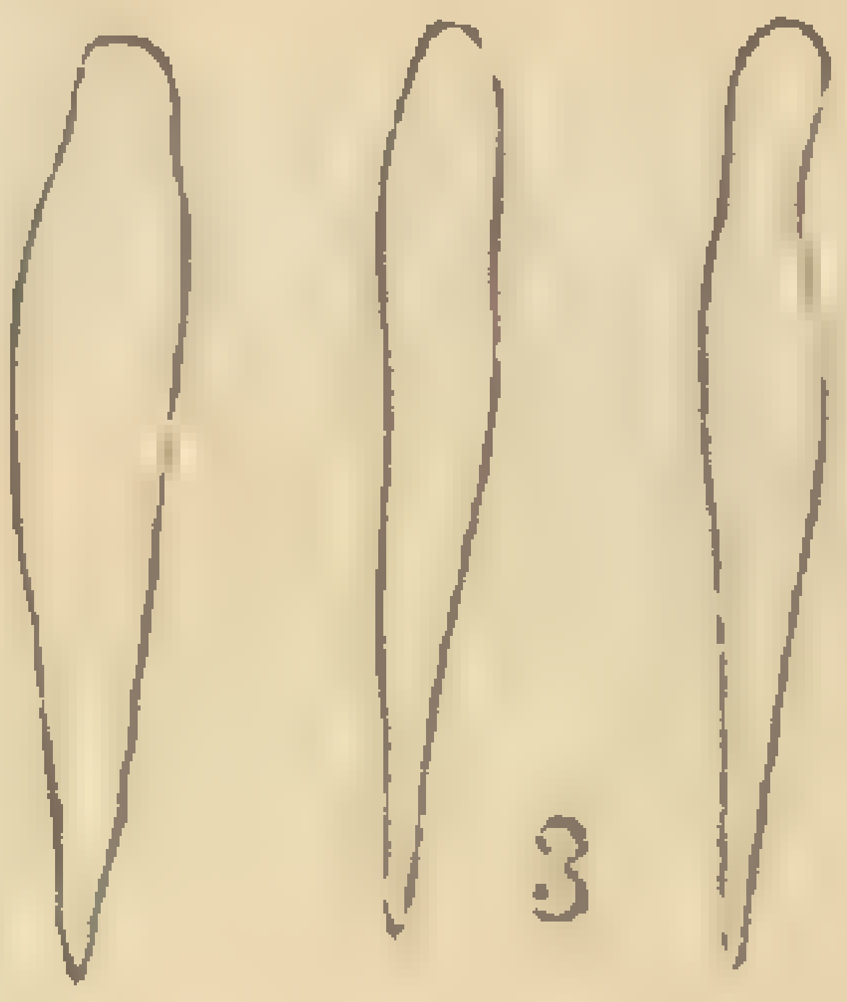
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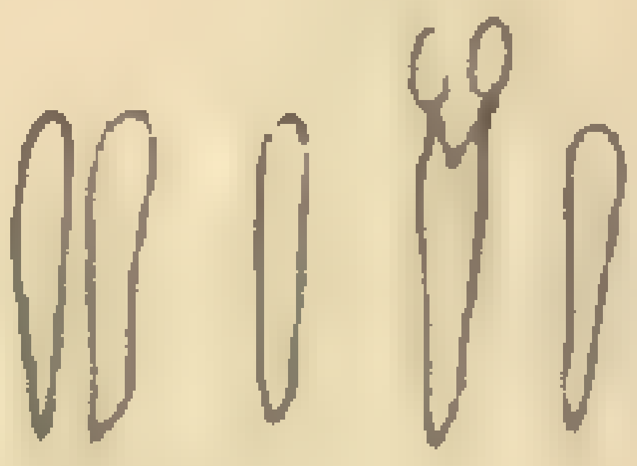
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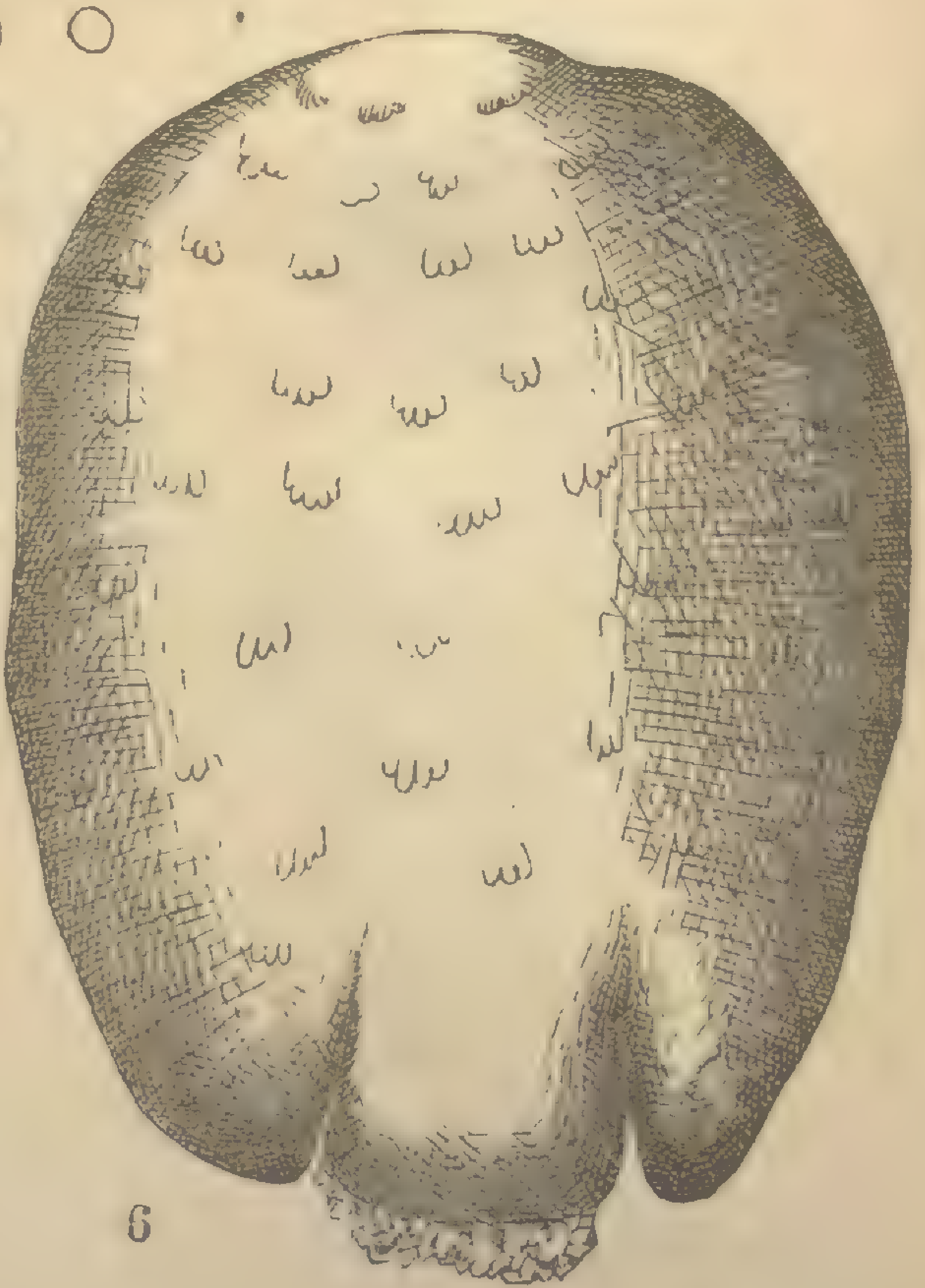
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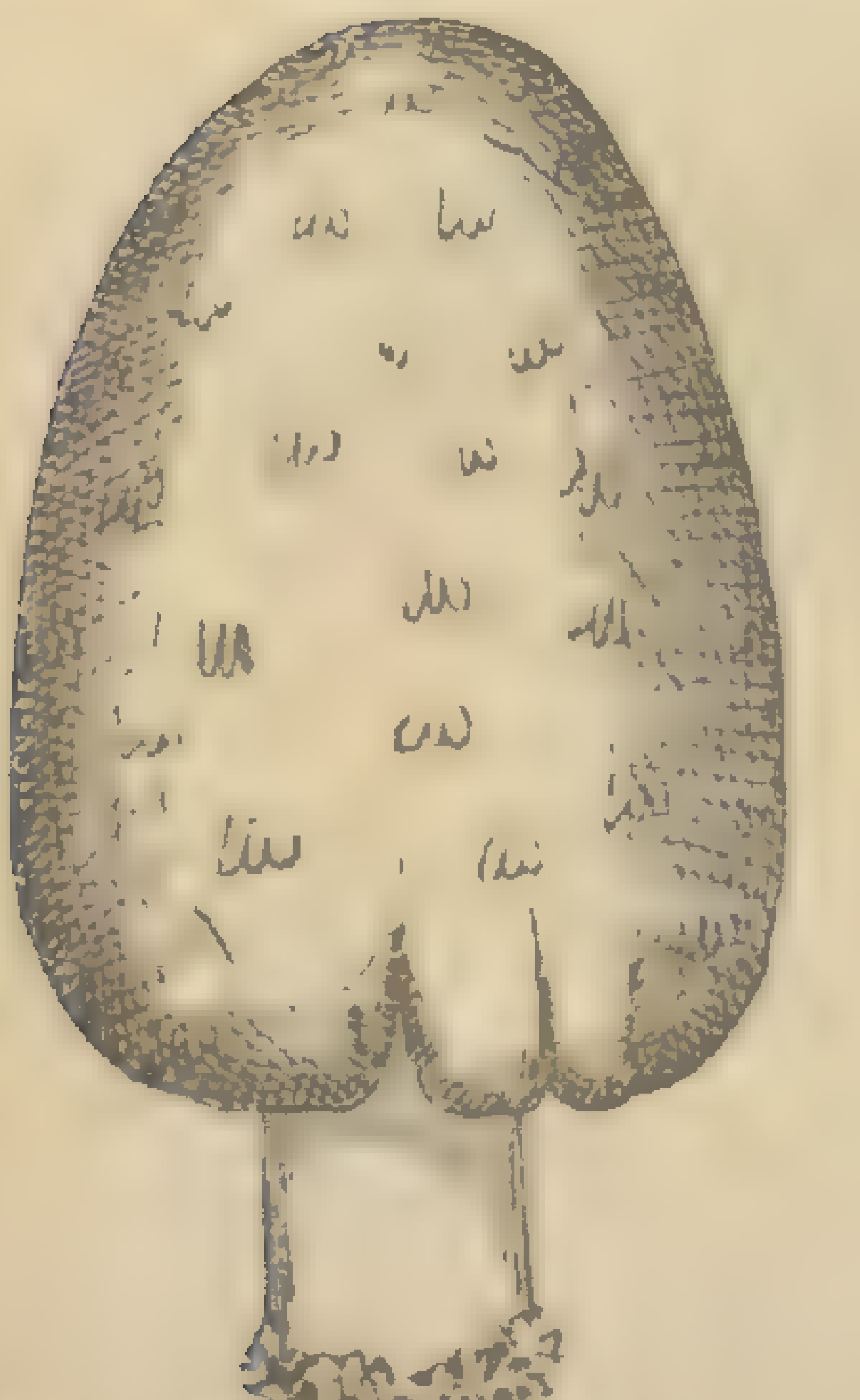
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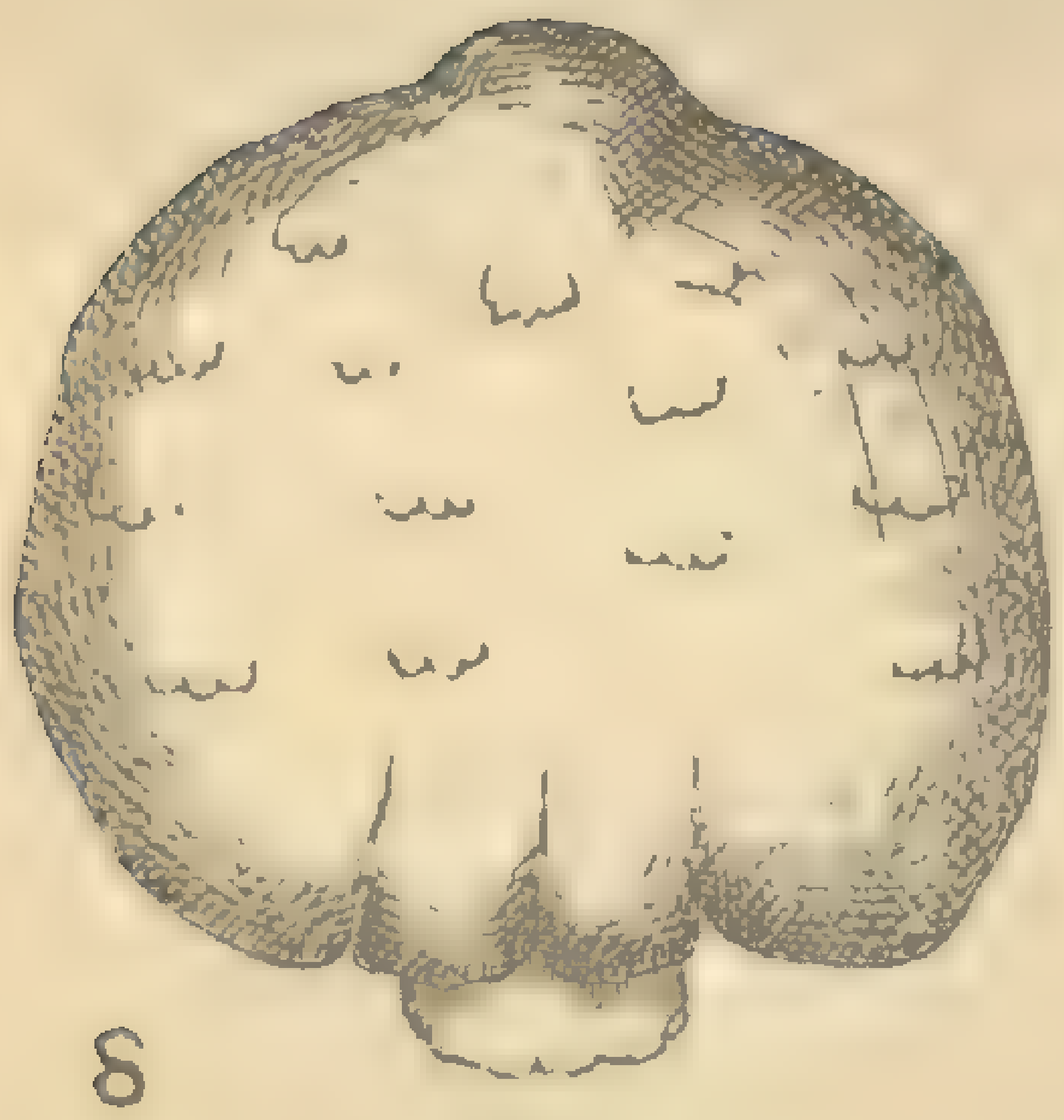
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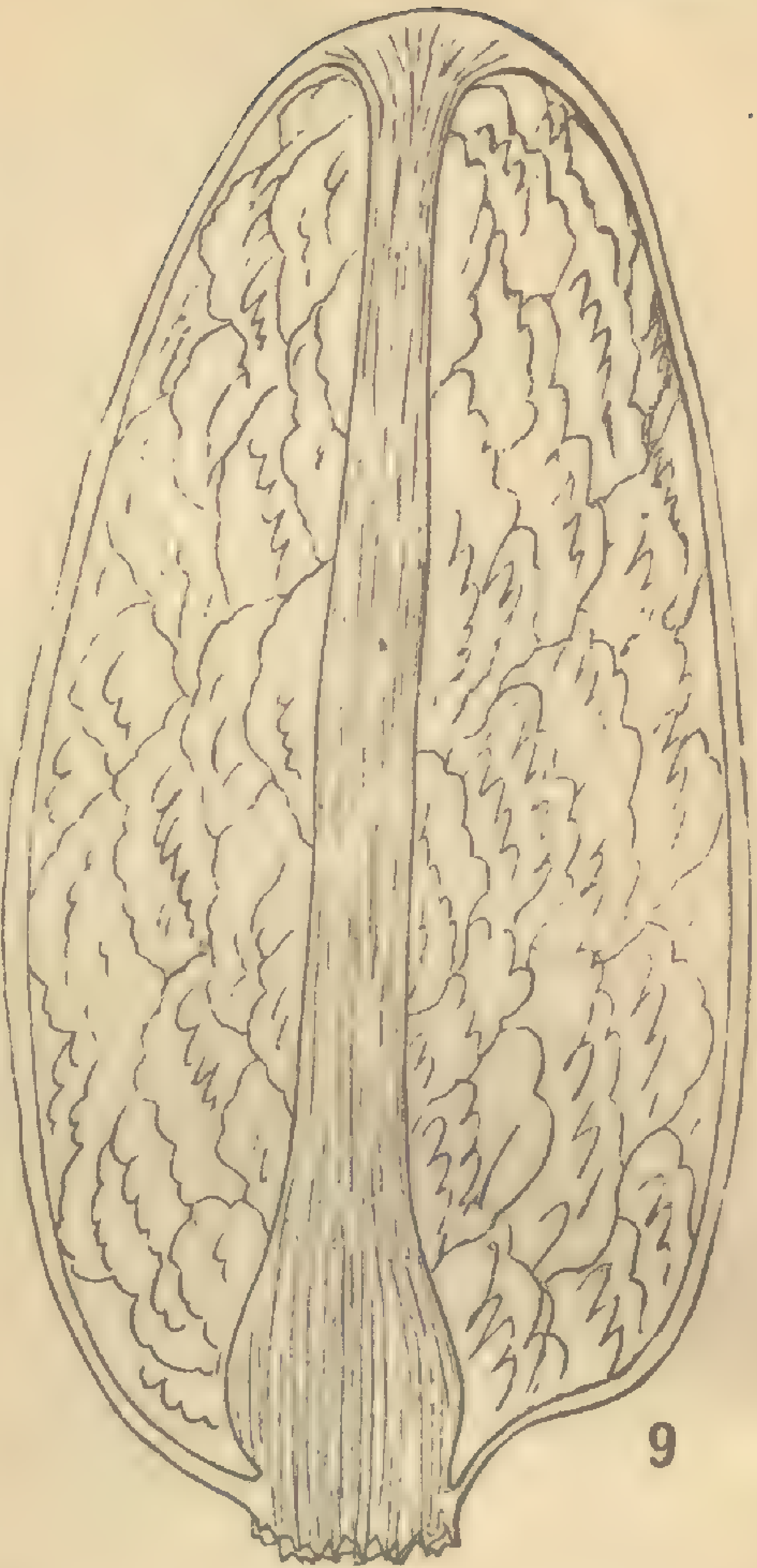
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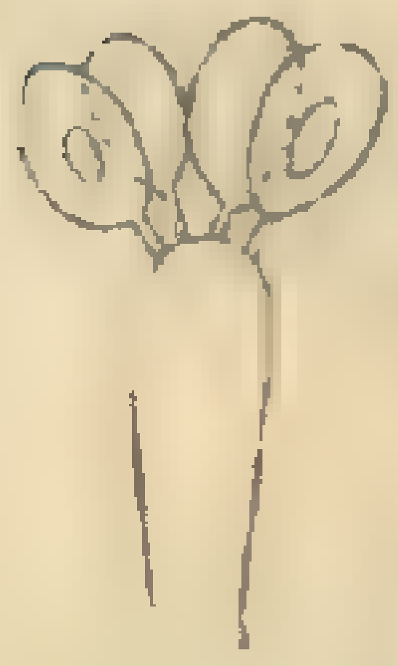
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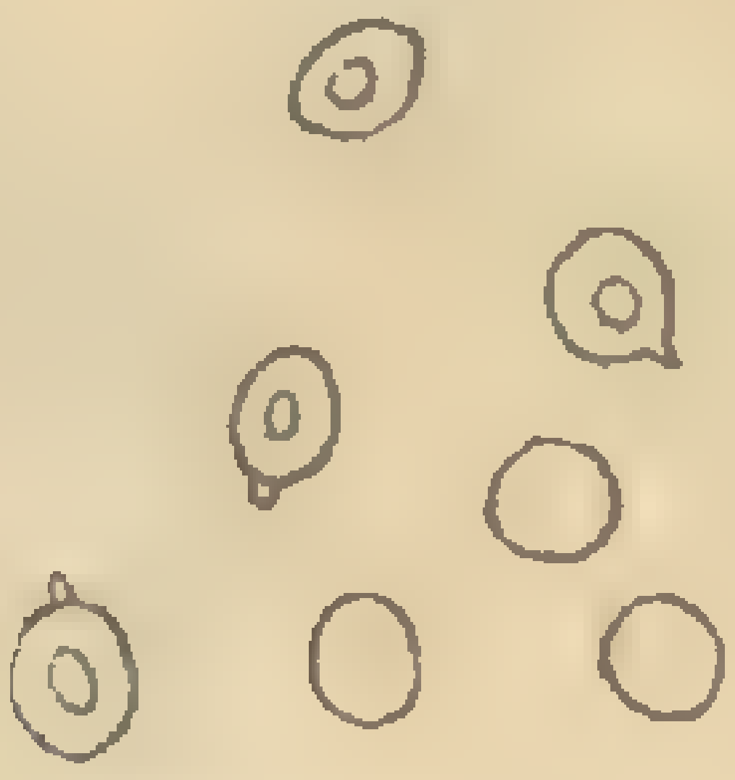
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Figs. 1 to 5, PHYSALACRIA INFLATA.

Figs. 6 to 11, SECOTIUM WARNEI, Pk.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. IX.] New York, January, 1882. **[No. 1.**

Fungi in Wrong Genera.

By Chas. H. Peck.

More than fifty years ago L. de Schweinitz sent specimens of a small American fungus to Prof. Elias Fries. He gave it, in his letter, the manuscript name, *Leotia inflata*; but Fries, taking it to be a species of *Mitrula*, published a description of it in Elenchus Fungorum, Vol. i, pp. 234 and 235, giving it the name *Mitrula inflata*, with a reference to the manuscript name of Schweinitz. In Epicrisis, p. 584, he repeats his diagnosis of the species thus: "*M. inflata albida*, capitulo subgloboso, inflato, stipite filiformi elongato."

In 1878, M. C. Cooke republished this diagnosis in Mycographia, p. 204, under the name *Spathularia inflata*, though it is not clear why the species was referred to *Spathularia*, for the plant has not a laterally-decurrent club, an essential character of that genus. He also published a figure of the plant, with the remark, "sporidiis ignotis." Inasmuch as this figure gives no representation of the fruit, it has seemed best to give a new one, representing the fungus more in detail. The reference in Micographia, *l. c.*, "*Leotia inflata*, Schw., Syn. Car. 1120," is erroneous, for this number belongs to "*L. circinalis*," which was evidently intended for *L. circinans*, as is shown by 738 Syn. N. A. Fungi. It does not appear that Schweinitz ever published a description of this fungus, and in the work last mentioned, at number 1068, he adopts the name *Mitrula inflata*, with a reference to the description in Elenchus Fungorum.

Having recently found and examined fertile specimens of this fungus, I have been forced to the conclusion that it belongs neither to the genus *Leotia* nor to *Mitrula*, nor yet to *Spathularia*, but to an undescribed genus of Hymenomycetes, belonging to the order Clavariei and related to the genus *Pistillaria*.

The plants usually grow in tufts of few or many individuals. Sometimes the heads are so closely crowded that they grow together, and frequently the stems are united at the base. Luxuriant specimens are about an inch high, but ordinarily they are one-half to three-fourths of an inch high. At first they are pure white, but with age the heads or clubs acquire a yellowish tint and then soon decay. The stems often remain firm and upright after the heads have decayed. The walls of the hollow club are very thin but rather tough, and when moist they will stretch considerably before the tissue will separate. Oblong, club-shaped bodies are scattered here and there in the hymenium which covers the head or club. These bear a strong resemblance to asci, and they may possibly have been thought to be such by those authors who first referred the fungus to Ascomycetous genera; but I am confident that they are not asci. I have not been able to detect spores in them, even in specimens which produced spores in abundance. They are usually a little narrowed or even contracted just below the apex, and probably correspond to the cystidia of Agarici. The basidia or sporophores are much smaller and more numerous. They form a thin stratum over the surface of the globose head. I have not clearly seen them with more than two spicules each. The genus and species may be described as follows:

PHYSALACRIA, *Gen. nov.*

(From φυσαλίς, a bladder, and ἄκρα, the top.)

Club subglobose, inflated, thin, somewhat tenacious, everywhere covered by the hymenium, supported on a distinct slender stem.

Distinguished from *Pistillaria* by the thin, inflated, bladder-like club and the distinct slender stem. The following is at present the only species known:

Physalacria inflata.—White, becoming tinged with yellow; club subglobose, submembranaceous, glabrous, flaccid, more or less uneven with irregular depressions or wrinkles, two to four lines broad; stem slender, equal, firm, straight, solid, four to nine lines high, minutely hairy or subfurfuraceous, mostly caespitose; spores minute, narrowly elliptical, colorless, .00016–.0002 of an inch long, and about half as broad.

Decaying wood and bark in woods and shaded places. It occurs especially in mountainous or hilly districts in summer.

The fungus described in the Bulletin, Vol. vi, p. 77, under the name *Lycoperdon Warnei*, was referred to the genus *Lycoperdon* with some misgivings, because the spores and capillitium presented characters not quite in harmony with the characters of that genus. Afterwards, specimens of the same fungus were sent me from Wisconsin by Mr. Bundy, but some of them showed a distinct stem. This indicated that the species might belong to the genus *Podaxon*, to which, in a remark in a paper on United States species of *Lycoperdon*, it was erroneously referred. Since that time, other specimens have been received from various sources, and a careful examination of them makes it necessary to refer the species to the genus *Secotium*. Besides, the plant is so very variable that a more comprehensive description is desirable.

Secotium Warnei.—Peridium subglobose ovate or oblong, one to four inches high, one to three inches broad, squamose, white, gray or brownish, sessile or with a short stem, when mature rupturing longitudinally at the base into four to six lobes or laciniae; internal mass at at first whitish, then dingy-yellow, finally olivaceous-brown or snuff-brown; spores subglobose or broadly ovate-elliptical, colored, .00025–.0003 of an inch long,

Fields, pastures and waste places. Illinois; H. A. Warne. Wisconsin; W. F. Bundy. Iowa; C. E. Bessey. Nova Scotia; A. H. McKay. Pennsylvania; Lizzie G. Barnett.

This fungus occurs especially in wet weather in summer and autumn*. The species is related to *S. Szabolcsiense*, Hazl., which is described as having the internal mass (when mature) chestnut colored and the peridium glabrous and splitting into ten to twelve lobes at the base, characters not shown by our plant. The scales in our plant are thin, whitish or brownish and generally appressed and spot-like. Sometimes they are evanescent in the dried specimen, but generally they are distinct. The internal mass or hymenium is at first white and seems to vary somewhat in its appearance. Miss Barnett says concerning these fungi, that, when cut, the inside resembles white crape all crumpled up, but after exposure this becomes brown and then dusty like ordinary Lycoperdons. Prof. Bessey writes that, upon cutting open one or two of these fungi, he observed a most remarkable regularity in the spore-bearing surfaces, and that they bore a resemblance to the gills of unexpanded Agaricini. The arrangement of the variously folded and united hymenial plates and their intercellular spaces is clearly not uniform, but I doubt if any characters for specific distinction can be drawn therefrom. I certainly find no satisfactory characters for distinguishing the Pennsylvania from the Iowa specimens. This species (and indeed the whole genus) is very interesting, affording as it does a beautiful connecting link between the Hymenomycetous Agaricini and the Gasteromycetous Trichogasters. The distinct stem shown by some of the Wisconsin specimens adds another feature of resemblance between the two groups, for it would be difficult without a close examination to say that one of these stipitate specimens was not an unexpanded Agaric. When mature, the spores may, by sudden pressure, be expelled through the chinks of the peridium in little smoke-like puffs, in the same manner as the spores of puff-balls.

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*Miss Barnett writes that she has also found it in May.

One other species of *Secotium* has occurred in this country, viz., *Secotium Texense*, B. & C., which, according to the description, has the hymenium black, the spores but .0002 of an inch in diameter and the stem ventricose and three inches high.

NOTE.—I have just received specimens of *Secotium Warnei*, with notes thereon, from Miss E. Butler of Minnesota. These indicate a still greater variation in the specific characters than that provided for in the description already given. First; the scales of the peridium are sometimes quite thick and broad, and are somewhat reflexed so that they give to the plant a rough or even a shaggy appearance. Second; the size is sometimes greater than the dimensions given in the description. One specimen before me measures five inches in length and the same in breadth in the widest part, and that too in the dried state. In the fresh condition it would be likely to be still larger. Third; the plants sometimes grow in tufts or compact clusters. The large specimen already mentioned is irregular in shape, the irregularity having been produced by the crowded mode of growth and the mutual pressure of contiguous individuals. The smallest specimen of the group from which the large one was taken is only three-fourths of an inch high and broad in the dried state. Miss Butler mentions two clusters or colonies, one composed of ten, the other of thirteen individuals. She says of the specimens, "they grew among rank weeds on waste land where garbage had been thrown." It is possible that in such situations they grow more luxuriantly than in open fields. Most of the Minnesota specimens sent me, as well as those from Pennsylvania, are subglobose, from which I infer that in these localities this is the prevailing form.

EXPLANATION OF THE PLATE.—*Physalacria inflata*.—Fig. 1, a cluster of plants. Fig. 2, a single plant enlarged. Fig. 3, three cystidia x 400. Fig. 4, five basidia, one of them bearing two spores x 400. Fig. 5, six spores x 400.

Secotium Warnei.—Fig. 6, an obovate plant. Fig. 7, a small ovate plant with a distinct stem. Fig. 8, a small subglobose umbonate plant. Fig. 9, vertical section of an oblong plant, showing the hymenial plates and percurrent stem. Fig. 10, a basidium bearing four spores x 400. Fig. 11, seven spores x 400.

Additions to the Flora of the United States.—*Crataegus arborescens*, Ell., is not uncommon in the rich alluvions of the Mississippi River, near St. Louis, and probably inhabits the banks of this river and its lower tributaries down to its mouth. It has not been recognized of late and seems to be quite rare in herbaria, and is probably not in cultivation. I have not much to add to Elliott's, Torrey and Gray's and Chapman's descriptions, but may say that in this neighborhood it is the largest species of the genus, making trunks from 8–12 and, as Mr. Eggert informs me, even 18 inches in diameter, 5–7 feet high, fluted or grooved, and with a broad top, rarely bearing any thorns. The leaves,cuneiform at base,undivided or,at the end of shoots, 3-lobed, resemble in form those of *C. tomentosa*, but are smaller, much thinner and smoother, even when young, often with soft down in the axils of veins underneath; flowers in loose corymbs, only 7 or 8 lines wide; calyx smooth, neither pubescent nor glandular, with triangular acute lobes; styles 5; drupes depressed-globular, 4-5 lines thick with 5 (or rarely more) stones grooved on the back, bright red or rarely orange-colored, persisting through winter, when those of our other species, *C. coccinea*, *Crus-galli*, *subvillosa* and *tomentosa* drop off.

Sagittaria natans, Michx., has been noticed by Mr. C. E. Faxon, since a number of years in Charles River, Mass., "at the depth of 2 to 4 feet, and entirely above the influence of tide-water," and also, as he informs me, in Neponset and in Ipswich Rivers, where Mr. J. Robinson found it. It flowers there from the middle of June to the end of July, but never perfects fruit, and thus is evidently not at home in those northern waters, where it has a precarious existence by stolons; these can only winter where deep water protects them from frost. The seed was probably first brought there from the South, by water-fowl who disseminate so many water-plants. Scape and phyllodia 2-4 feet long, barely reaching the surface of the water, leaf-blades rarely developed, and then linear-lanceolate; raceme as well as pedicels often elongated in order to reach air and light; flowers 6-7 lines wide, opening in forenoon, submerged again toward evening, only one or two of the lowest whorl fertile, the others all male; male flowers with 6 exterior and 1 or 2 central stamens; filaments about as long as the nearly orbicular anthers, bulbous at base and smooth; pistils of the female flowers numerous, minute, erect, style as long as the ovary; fruit (never matured in the North) in southern specimens marked by several (5 or 7) denticulate crests on back and sides. *Sagittaria pusilla*, Pursh., must be considered as a subterrestrial form of this species, distinguished only by its size and by a 3-crested achen. *S. graminea*, with which I had confounded the northern form, is distinguished by the great number of stamens and the papillose filaments, even where the fruit can not be compared.

G. ENGELMANN.

Notes from Utah and Nevada.—It was my good fortune on returning from California to spend a day or two in the East Humboldt Mountains, Nevada, where Mr. Watson botanized years ago. Some very interesting plants were found; among them, *Aspidium aculeatum*, var. *scopulinum*. This grew in the crevices of rocks at 9000 feet altitude. On reaching Salt Lake City, I had occasion to botanize at Wasatch, 20 miles southeast, at the mouth of Little Cottonwood Canyon, (altitude about 5000 feet); there I found the same fern growing in the crevices of wet rocks. It has the habit of *Aspidium Lonchitis*, and closely resembles it. I see no resemblance to *A. aculeatum* and cannot see how it came to be referred to that species. I understand that Prof. Eaton contemplates transferring it to *A. mohrioides*. I was able to secure quite a number of fronds and two living plants, by which it will be possible to study it still more closely. I am indebted to Mr. Davenport for the determination.

Prof. Eaton, in Bot. Wheeler's Rep., says that the sterile fronds of *Pellaea densa* are rare. This is not the case in Utah. They are on almost every root of plants that grow at high altitudes.

The spore-cases of *Notholaena dealbata* are quite interesting. They are oval, light chocolate-brown, splitting entirely in two, one half remaining behind like the lower half of the pod of *Portulaca*, making the frond appear as if covered with minute shells.

In my specimens of *Sidalcea malvaeflora* the pods are reticulated, not smooth as stated in Botany of California.

Dalea polyadenia is thorny and makes unpleasant swellings, when the thorns pierce the flesh, as though it were poisonous.

Astragalus multiflorus dries black, and is almost the only species that I know which does dry thus.

The appressed hairs of *Townsendia scapigera* are almost always two-jointed and bent at the joints and so appressed.

I have specimens of *Chaenactis Douglasii* from Nevada, with the five outer pappus-scales black at base and almost as long as the akene, the five inner scales narrow, half as long; akene hirsute.

In *Chaenactis carphoclinia* the chaff subtends only one or two rows of outer akenes in my specimens.

Allium validum has a narrowly-winged stem, and bulb-coat reticulated, much like *A. anceps*; the style is not always "longer than the stamens." In other respects my specimens agree with Watson's, which were gathered in the same mountains.

I have *Carex luzulaefolia* from the East Humboldt Mountains, Nevada, as well as from the Wasatch.

I noticed in a former article that the shape of the sterile filament is now given up as a test in *Scrophularia Californica*. The Utah plants which I have seen have the leaves of *nodosa* and the inflorescence of *Californica*, which adds another to the strong points against the specific value of *S. Californica*. I found a number of plants this season which were devoid of any vestige of a sterile filament.

The flowers of *Phlox canescens* are very often pink or purple, as well as "white."

The seeds of *Erythraea Douglasii* are not "globular" in a great many plants. They also vary in size.

Salt Lake City, Utah. MARCUS E. JONES.

Onoclea sensibilis, var. **obtusilobata.**—Seeing the notes in the September and October BULLETINS on that form of *Onoclea sensibilis* usually called variety *obtusilobata*, I thought it might be of interest to state in what localities we have found it, and something of my experience in trying to cultivate it in my garden.

I first found, growing in profusion, in a low marshy meadow, some of the finest fertile *obtusilobata* forms, from the same rootstocks on which were the ordinary sterile fronds. Growing side by side in this meadow were all the forms mentioned by Mr. Underwood, as well as some with acute segments open in fructification. When I first visited this spot and found the finest specimens, it had not been mown over; but since that it has been mown every year, and the specimens are not so fine *obtusilobota*. I have also found it growing by roadsides at Pompey Hill, in dry localities, regularly mown. There, most of the fronds more nearly approached the normal sterile form, some having one-half entirely sterile and not at all contracted.

Last year, on our first visit to Cicero Swamp, Mrs. Myers found a great abundance of *obtusilobata* in a portion of the swamp which had been cleared of trees, but not burnt over nor at all cultivated. In the sphagnum, near by, we found *Chiogenes hispidula* and *Gaultheria procumbens*.

In a swampy woods, near Centerville, we have found, several years in succession, fine specimens of *obtusilobata*, while on the Jamesville Road, a few years ago, there used to be a long stretch of the beautiful *Onoclea sensibilis* (never any of the variety) skirting a rich low wood; but the hand of the spoiler felled the woods, and since that time it has all died out without ever showing any *obtusilobata* forms.

Often, when I have found what seemed to me the most perfect *obtusilobata*, I have brought it home and planted it in my fern-bed in the garden only to have it show fine normal sterile fronds (no fertile ones whatever) while by its side *Struthiopteris Germanica*, collected from similar localities, would send up year after year good healthy fertile fronds.

Whether all of this will aid much in proving that *obtusilobata* is no variety and that it is an effort of the species to form a variety, or whether a reversion, I greatly doubt.

Syracuse, N. Y. MARY OLIVIA RUST.

Myco-Lichens.—In the recent work by Dr. A. Minks, entitled Symbolae Licheno-Mycologicae, devoted to maintaining that a large number of Fungi, amounting to several thousands, are properly to be regarded as Lichens, a list of a considerable number of these Fungi, or Myco-Lichens is given. As several of these occur in this country, a list of them may be of interest to American fungologists, and is given below. The plants considered, are arranged in series, probably to indicate their affinities, though it is not so stated. In the following list, the series are separated by a dash, and the page on which they are mentioned is given.

Dr. Minks is the most vigorous opponent of the Schwendener theory, that so-called lichens are only fungi parasitically associated with algae, who has yet appeared. His studies have been extensive and exhaustive. Unfortunately, the style in which his views are expressed is so difficult as to be anything but attractive; and few in this country, probably, will have the patience to read his work, Das Microgonidium, in which his doctrines are conveyed. He has many original opinions, some of which have not been verified by other observers; but several have seen the *microgonidium*, the organ which, according to Minks, is the fundamental one of lichen structure, and which distinguishes it absolutely from all fungus structure. The microgonidium is an extremely small, simple cell, which, under proper treatment, can be seen in all parts of lichens—in the hyphae, the paraphyses, the spermatia, and the spores, and its history and development are very fully treated in the work above-mentioned.

A few words will elucidate Dr. Minks's mode of treatment. A thin section of the thallus or apothecium of a lichen is to be soaked for a short time (from five to ten minutes), in *liquor potassae.* It is then to be washed and placed in dilute sulphuric acid for about three-quarters of an hour, or until it becomes of the consistence of soft putty. It is then to be placed on a slide, in water, and a small portion of solution of iodine added. With a suitable light, and sufficient magnifying power, the microgonidia are then visible, as minute cells of a bluish-green color. Dr. Minks recommends the use of an immersion lens, and a magnifying power of 1000, with the light reflected from a cloud. It is the detection of microgonidia in the tissues of the fungi enumerated, which leads Dr. Minks to include them among lichens; and a wide field is here opened for those who use the microscope.

1.	*Tympanis picastra*, Berk & Curt.	*Ala.*,	p. 11.
2.	*T. Ravenelii*, B. & C.	*S. Car.*,	p. 12.
3.	*Phacidium elegans*, B. & C.	*N. Car.*,	p. 12.

4.	*Tympanis viticola*, (Schwein) Fr.	*N. J.*,	p. 36.
5.	*T. conspersa*, Fr.	*N. J.*,	p. 48.
6.	*T. fasciculata*, Schwein.	*N. J.*,	p. 48.
7.	*Cenangium Cerasi*, (Pers.)	*Mass.*,	p. 52.
8.	*C. Magnoliae*, B. & C.	*Fla.*,	p. 54.
9.	*Nodularia acericola*, Peck	*N. Y.*,	p. 55.
10.	*Dermatea carnea*, Cooke & Ellis.	*N. J.*,	p. 56.
11.	*D. carpinea*, (Pers).	*Mass.*, *N. Y.*,	p. 59.
12.	*Patellaria Rubi*, Lib.	*N. J.*,	p. 63.
13.	*Dermatea tabacina*, Cooke.	*N. J.*,	p. 69.
14.	*Cenangium turgidum*, Fr.	*N. J.*,	p. 71.
15.	*Lecidea resinae*, Fr.	*N. E.*,	p. 73.
16.	*Lecanidion fusco-atrum*, Rehm.	*N. J.*,	p. 81.
17.	*Patellaria atrata*, (Hedw.)	*N. Y.*,	p. 82.

18.	*P. indigotica*, Cooke & Peck.	*N. Y.*, p. 83.
19.	*P. cucurbitaria*, Cooke.	*N. J.*, p. 84.
20.	*P. dispersa*, Gerard.	*N. Y.*, p. 84.
21.	*Cenangium triangulare*, (Schw.).	*N. J.*, *Mass.*, p. 114.
22.	*Phacidium crustaceum*, B. & C.	*Mass.*, p. 115.
23.	*Phacidium autumnale*, Fckl.	*Iowa*, p. 131.
24.	*Patellaria ferruginea*, C. & E.	*N. J.*, p. 150.
25.	*Phacidium dentatum*, Schmidt.	*N. Y.*, p. 155.
26.	*Discella discoidea*, C. & P.	*N. Y.*, p. 170.
27.	*Phacidium carbonaceum*, Fr.	*N. Y.*, p. 172.
28.	*Discella leguminum*, Cooke.	*Texas*, p. 174.
29.	*D. macrosperma*, Peck.	*N. Y.*, p. 174.
30.	*Eustegia, Magnoliae*, Peck.	*S. Car.* p. 175.
31.	*Patellaria, lignyota*, Fr.	*N. J.*, p. 175.

New Bedford, Mass. H. W.

Nutation in Epilobium angustifolium, L.—This plant, which is put down in the botanies as willow-herb, but is more frequently called fire-weed, exhibits the phenomenon of nutation in a very marked and interesting manner. The young flowers-buds at the tip of the raceme are erect. A little later, as the stem (axis of inflorescence) elongates, they point downwards and are closely pressed against the stem. Still later, the peduncles of the half-grown flower-buds begin to rise, and soon form nearly a right angle with the stem. Later still, when the buds are fully developed and begin to open, the angle is lessened to about forty-five degrees; while the fruits, when mature, are, for the most part, nearly or quite erect. Thus the flowers, or at least the ovaries, from the time of their formation to their fruiting, traverse, twice over, the arc of a circle of nearly ninety degrees. What advantage the plant gains by these movements it might be difficult to say. Possibly the movements may have some relation to those which are known to pertain to the stamens and style. Observations during the growing season, by any one having the opportunity, would no doubt bring out some interesting facts.

Cornell University. A. N. Prentiss.

Growth of Exogens. III.—This subject is one of such importance to science that I feel anxious to put before the botanists of the country all the information that comes into my possession.

In a conversation with one of the professors of Washburn College, Topeka, Kansas, on the growth of Exogens, he informed me that for some years he had charge of the trees upon the college grounds.

In order to get shade as soon as possible, the cottonwood (*Populus monilifera*) had been set alternating with other trees, with the design of removing the cottonwoods as they grew large enough to interfere with the growth of the more desirable trees.

In that locality a dry season occurs with marked constancy, beginning about the first of July and ending about the first of September, while September is usually a wet and warm month. In watching the remarkable growth of the cotton-woods, the professor's attention was drawn to what he thought was a check in their activity in the latter part of the dry season, and the pushing of the terminal buds in September and early October. He became deeply interested in what he regarded as an abnormal condition, and watched with great care until he was convinced that a new, or second tube of wood was formed during this second growth. To test the matter fully he examined cross-sections of some branches whose age he knew, and found that the number of concentric rings exceeded the number of years they had been growing.

In 1877 the dry season set in earlier, commencing about the 20th of June and ending about the 10th of September. This year was peculiarly well suited to testing the truth of second growth, as the dry season was succeeded by wet and warm weather. As soon as frost set in and vegetable growth had ceased, he made cross-sections of several young branches and found that two distinct tubes of wood had been added during the year.

In further proof of the second growth hypothesis, I add the observations and experiments of Désiré Charnay, who is now exploring the ruins of Central America. He had grave doubt as to the great antiquity assigned to some of the ruins that had been laid bare ; and he learned, moreover, that the conclusions had been arrived at by counting the rings in the cross-sections of large trees which had grown upon the ruins, some of which exhibited rings enough to indicate that the trees were 2,000, 2,500 and even 3,000 years old—calculating upon the basis that one ring is made in a year. Mr. Charnay, had his attention drawn to the investigation of the one ring theory in cutting down a sapling which he knew to be eighteen months old, and on whose cross-section he counted 40 concentric rings, making more than two for every month of the plant's life. These observations were followed up by Mr. Charnay, with the same comparative result, *i. e.*, that more than one tube of wood is made during the year ; hence he was forced to the conclusion that no reliance could be placed upon that mode of determining the date of the ruins.

On a careful examination of the mangrove I was led to the belief that exogenous growth in regions of no frost is very different from that in the regions of frost, where most of our trees make but one *distinct* ring. I am sure that most of them during some seasons make indistinct rings.

The mangrove puts forth a very vigorous growth, then rests apparently from exhaustion, having formed terminal buds in all its branches. After a short period of rest it pushes its buds and a new growth takes place ; then, after another period of great activity, there ensues another rest, and so on. In each case a new tube is formed, so that two or many may be made in a year.

I have procured from Southern Florida and Southern Texas specimens of many sorts, all of which confirm my belief in the hypothesis that our exogens in regions of frost, as well as in the Tropics may, and frequently do, make two or more distinct tubes of wood in one growing season.

White Plains, N. Y. O. R. WILLIS.

Concentric Annual Growths.—There is no connection between the longitudinal (branch) growth of plants, and the generation of the cells which form the annual layers of wood in the trunk. *Quercus Robur* often has two distinct periods of longitudinal growth the same season in Europe, and in our country nearly always three—but I have never seen more than twelve annual circles of wood in a twelve-year old tree, though I have seen and counted many when cut down for poles at that age.

THOMAS MEEHAN.

Teratological Notes. (From observations made during the season of 1881).—*Symplocarpus foetidus*, Salisb., with two spathes, one within the other, the opening of the inner facing the back of the outer; no spadix. Also a specimen of the same plant with a tuft of well-developed leaves from the centre of the spathe, in place of the usual spadix.

Podophyllum peltatum, L., with a single peltate leaf, having a flower-bud about one inch below it, and with one of the bud-scales at the surface of the ground bearing at its summit a small sub-peltate leaf. Also a specimen of the same plant with three peltate leaves; two of these forking above the insertion of the first, and bearing the flower in the axil.

Hepatica triloba, Chaix., with four involucral leaves, the outer of which was enlarged, and evidently three-lobed.

Claytonia Virginica, L., with unequally bifid, or slightly laciniate petals.

Houstonia caerulea, L., one flower having six sepals and six petals, and two or more flowers with five sepals and petals, growing close together, but not from the same root. The six-parted one had also a four-parted flower on a branch of the same stem. Also, in another locality, a plant with a three-parted flower.

Ranunculus bulbosus, L., with the principal stem flattened, about one-half inch wide, and terminating in a distorted head of fruit.*

Also a scape of *Taraxacum* deformed in a very similar manner to the above.

Plantago lanceolata, L., bearing two diverging spikes from the summit of the same scape.

Vesbascum; evidently a hybrid, and probably *V. Blattaria*, L., fertilized by *V. Lychnitis*, L. It had the general appearance of the former, but tended to branch more paniculately, and to have more flowers (about 4) from the axil of the same bract. The stem was slender, with the leaves more tapering and more woolly than in the last, and the flowers were also slightly less. The pods did not seem to develop fully, and, as far as observed, no seed perfected.

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* Fasciation in this species, as well as in *repens* and *acris*, was more than ordinarily common in the vicinity of New York last spring.—EDS.

Cirsium lanceolatum, Scop., with pure white flowers.

A seed of *Fraxinus Americana*, L., with triquetrous wing.

Taraxacum, with scape bearing about midway a foliaceous bract, and a similar one just below the involucre.

Concordvillle, Pa. WILLIAM TRIMBLE.

Heterocentron roseum of the conservatories acts in the same exquisite manner as its cousin *Rhexia*. The eight stamens are in two sets, one set dehiscing before the other. In the bud, the anthers are so thrown over that their backs are against the style. The long connective is, at its union with the filament, bifurcated into two diverging "setae" in the outer stamens, while the other set is devoid of these appendages. I have been delighted to find that, upon pressing the bellows-like anther with a blunt pencil, the pollen was ejected to a full inch in distance and with great force.

W. W. BAILEY.

Migrations of Plants.—Some years ago I sold a piece of ground through which a street was made, forming in one part, by damming the surface water, a small marsh. A few years afterwards I found one plant of *Typha latifolia* growing there. It did not at that time grow naturally within many miles. I feel as sure as we can be of most things, that the seed did not get there by human agency. I had seen snipes in the little marsh, and I concluded it the most probable that the seed had been brought with the mud in the feet of aquatic birds. It seems possible for many plants to be distributed by this means, and possibly the *Marsilia quadrifolia* found above Dedham by Mr. Clapp, may have been introduced to the Charles River in that way. If this should prove a sound guess, it may come about that the Connecticut plant is a comparatively modern introduction through the agency of some larger arctic water bird which wandered there from Siberia, where the plant is known to grow, or some nearer place perchance, where it has not been collected yet. It seems to me that when plants which may be easily distributed are found but in limited localities, we may act on the presumption that they are recent introductions. I think it would help geographical botany very much if the first appearance of even common plants in any new locality were placed on record. In this respect, Mr. Lester F. Ward's notes on the flora of the vicinity of Washington seem to my mind, very valuable.

THOMAS MEEHAN.

A large Grape-vine.—Many years ago I found a colony of large grapes-vines, supposed to be *Vitis Labrusca*, L., in Wayne County, Ohio. A few years ago I revisited the spot for the purpose of making measurements. The trunks (for such they were) ranged from three inches to over a foot in diameter, the longest one having a circumference of thirty-seven inches at about four feet from the ground.

Ames, Iowa. C. E. BESSEY.

Hieracium aurantiacum, L.—This is generally considered as an introduced species, but lately there seems to have been considerable doubt expressed on the subject by many observers. During the summer of 1878 I found it growing in the wild region near Port Henry, N. Y., where few introduced plants had yet gained a foothold. Others have also noted its occurrence in situations that almost preclude the possibility of its having been introduced. The locality mentioned was quite thickly wooded and broken with cliffs and outcrops of limestone. In the immediate neighborhood were none but native species such as *Asplenium ebeneum*, *Camptosorus rhizophyllus*, *Linnaea borealis*, etc. It would be of interest to know the character of the surroundings in other localities where it has been observed.

ARTHUR HOLLICK.

Hieracium aurantiacum.—I see in the October number of the TORREY BULLETIN a notice by John H. Redfield of *Hieracium aurantiacum*. He says he found the plant among the Catskills on the 26th of August, and that it was then just coming into flower, the scapes being from 3 to 6 inches high. The locality he describes must be the same at which I found it much earlier in the season. About the 4th of July it was in full bloom, with scapes from 6 to 12 inches in height. By the last of July the bloom was over. Up to that time the grass had not been cut.

Germantown, Pa. MARY S. COPE.

Epigaea repens.—Mr. James L. Bennett writes us that this plant was in flower in Providence, R. I., during the last week in December.

Proceedings of the Torrey Club.—The regular meeting of the Club was held at the Herbarium, Columbia College, Tuesday evening, Nov. 8th, 1881, the President in the chair and fifteen persons present.

Dr. Kunze exhibited an ear of corn raised from a seed alleged to have been taken from a Peruvian mummy, and which was supposed to be 1,500 years old when planted. This gave rise to a lengthy discussion on the vitality of seeds, at the conclusion of which Dr. Kunze announced that he would prepare a paper on the subject for the next meeting.

The President exhibited an additional collection of plants from the Western Territories.

Judge Brown presented for the Club's herbarium a number of adventive plants from ballast grounds near the city.

Three persons were elected active members.

At the regular meeting of the Club held Tuesday evening, Dec. 13th, the President occupied the chair and twenty-three members were present.

Dr. Kunze read a paper on the "Vitality of Seeds," which we hope to print at some other time.

CORRECTION.—By an oversight in our December number, *Omphalodium Hottentottum* **Arizonicum* was indicated as a variety, instead of a sub-species as it should have been. *Pertussaria*, in the same article, should read *Pertusaria*.

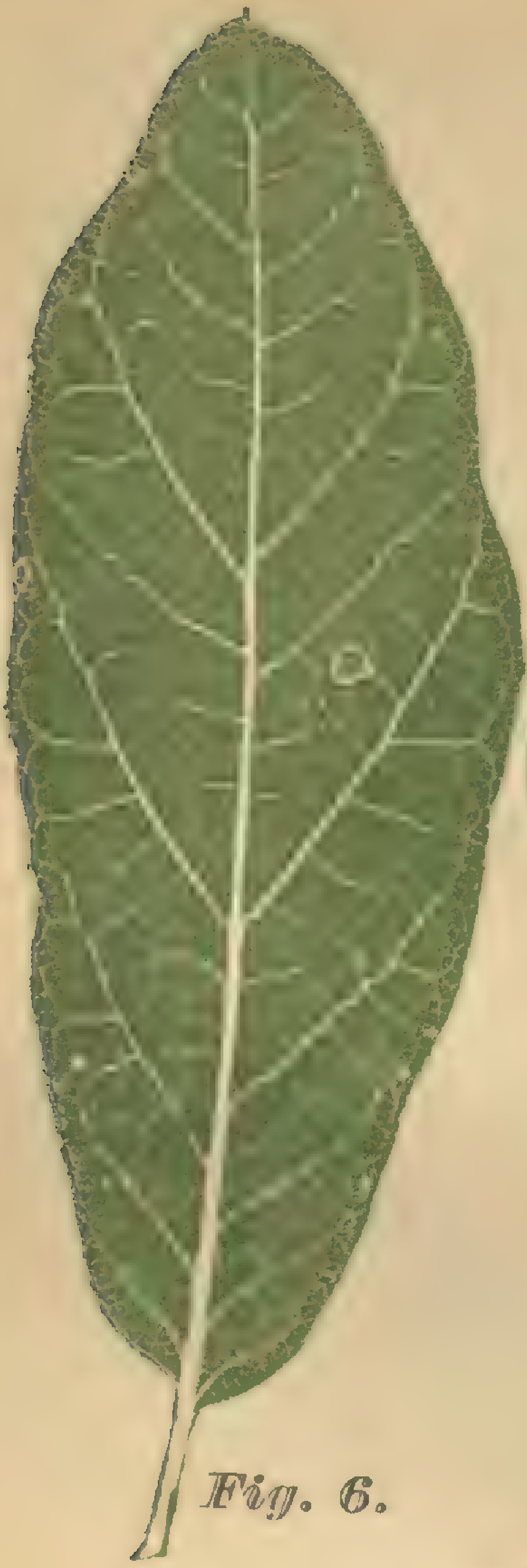


Fig. 6.

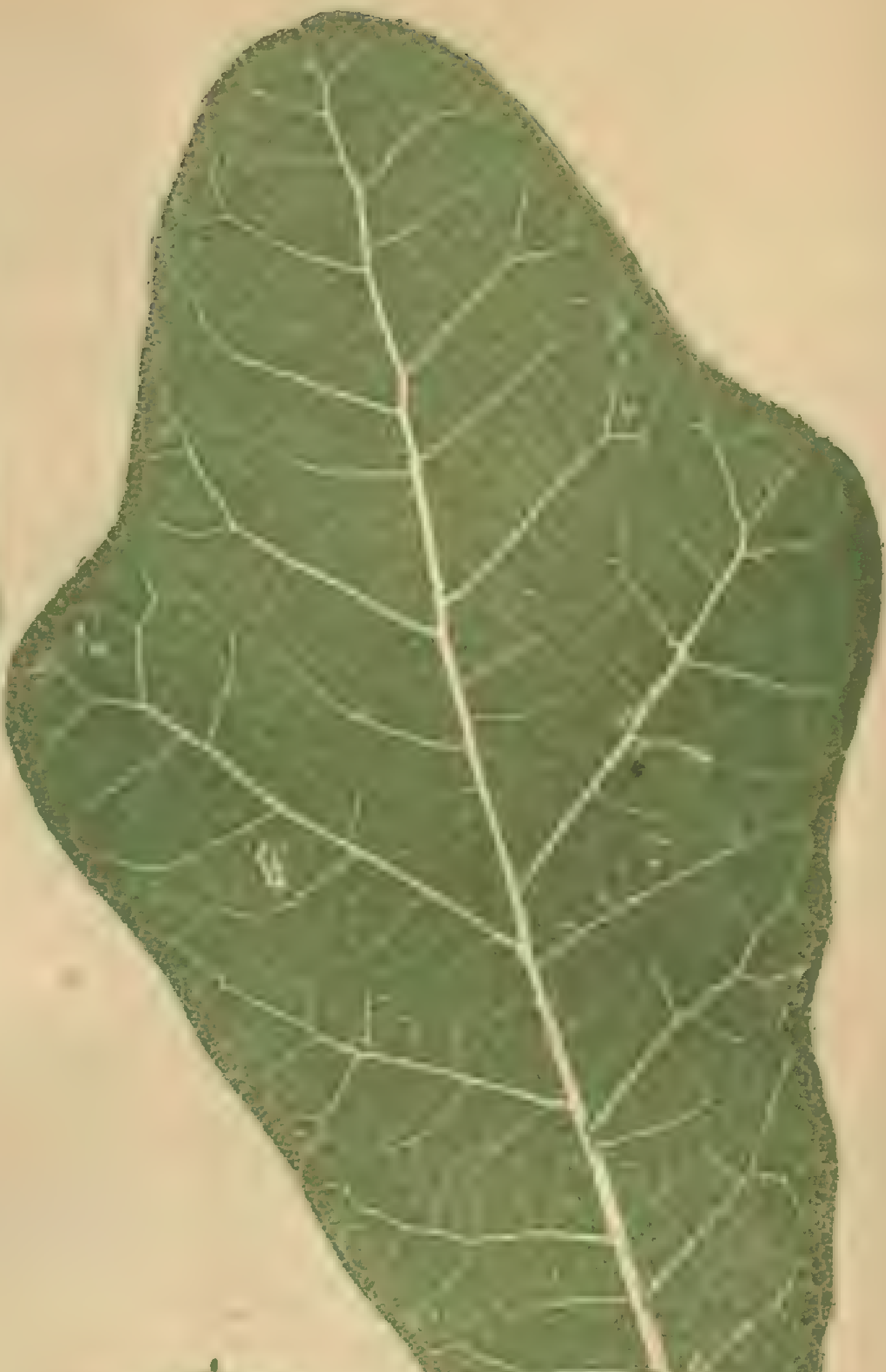
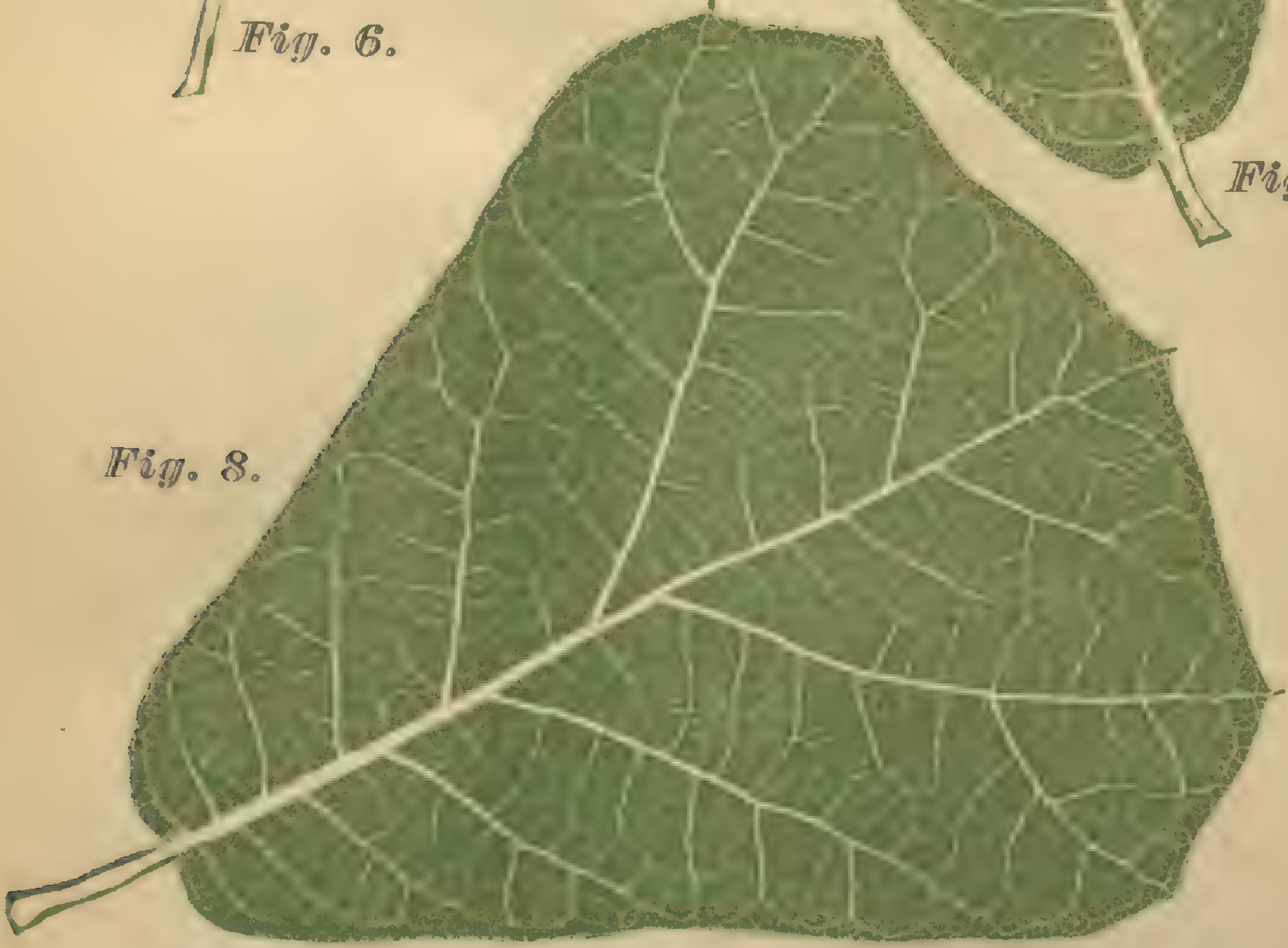


Fig. 7.

Fig. 8.



FIGURES 6, 7.----Q. PHELLOS, L., X Q. NIGRA, L.,= Q. RUDKINI.
FIGURE 8.------UNLOBED Q. NIGRA, L. (Q. FERRUGINEA, MICHX.)

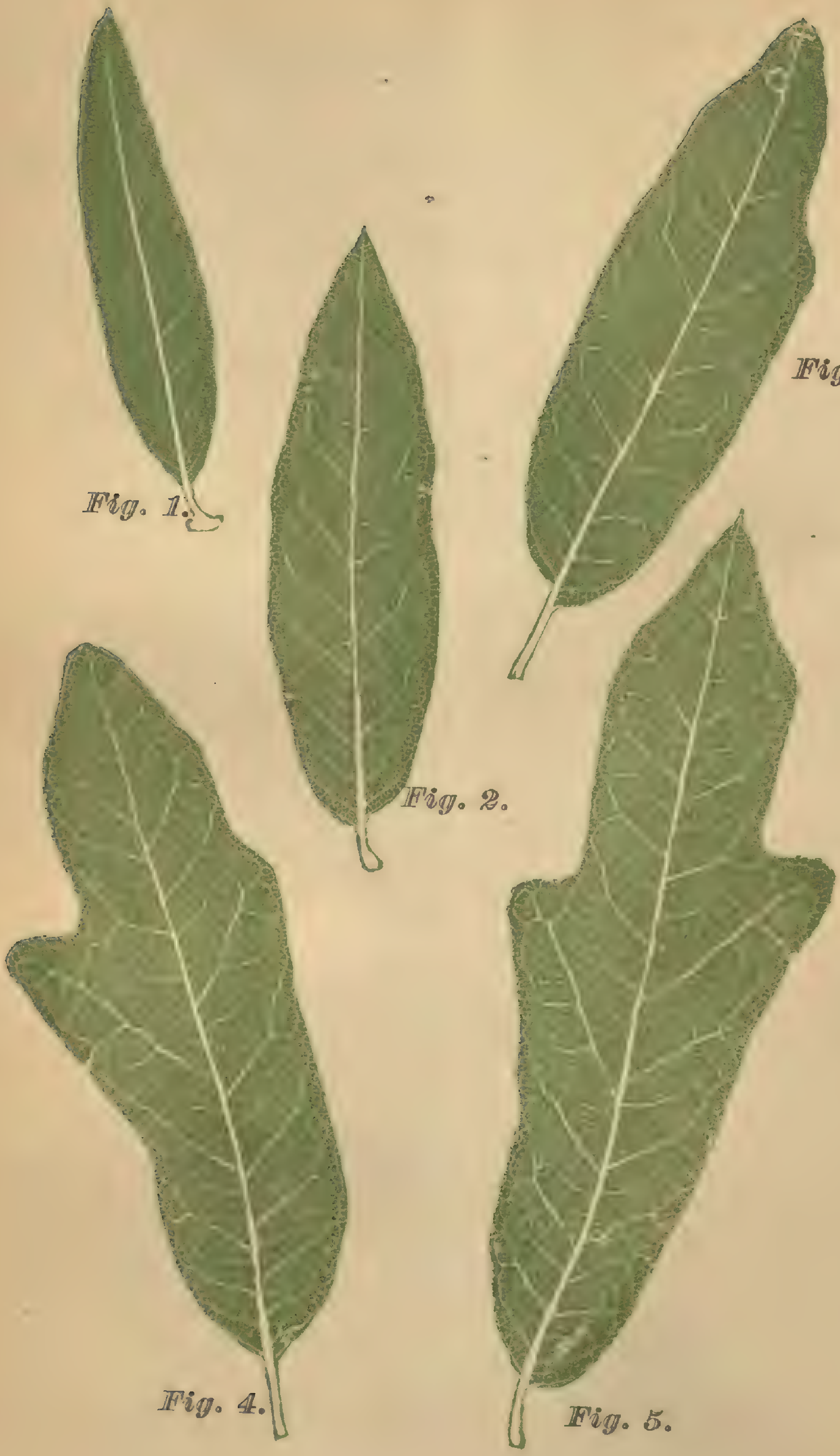


Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.

FIGURE 1.----QUERCUS PHELLOS, L.

FIGURES 2, 3, 4, 5.----Q. PHELLOS, L., X Q. NIGRA, L., = Q. RUDKINI.

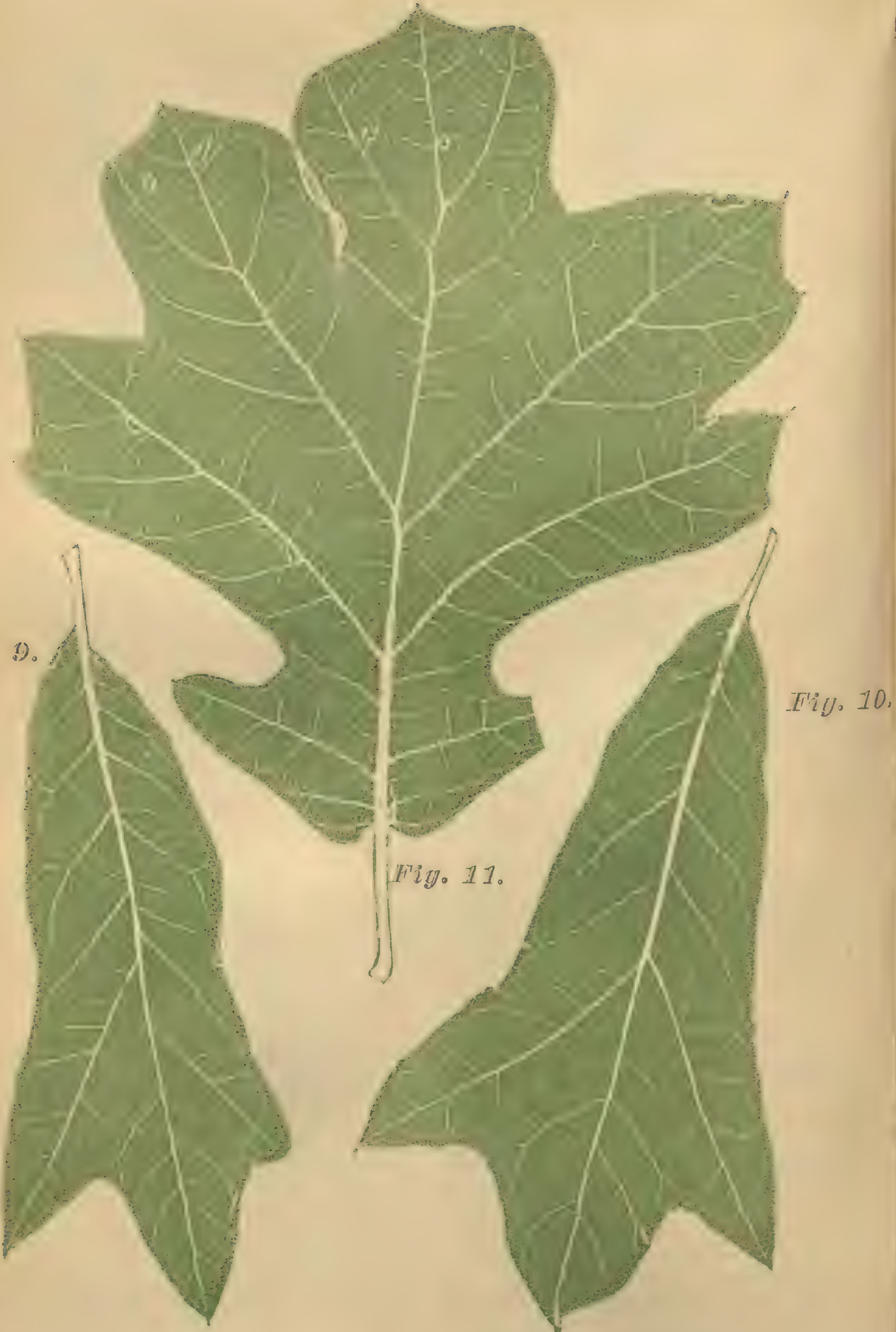


Fig. 9.
Fig. 10.
Fig. 11.

FIGURES 9, 10.----Q. PHELLOS, L., X Q. NIGRA, L.,=Q. RUDKINI.
FIGURE 11.------LOBED Q. NIGRA, L.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

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On a Hybrid Oak near Keyport, N. J.

By N. L. Britton.

(Plates x, xi and xii.)

In the early part of September, 1881, Messrs. W. H. Rudkin and Wm. Bower, while botanizing between South Amboy and Keyport, New Jersey, noticed a number of oak-trees whose leaves and acorns seemed different from those of any species known to grow in the vicinity of New York, and which apparently indicated every form of outline and lobing between those of typical trees of *Quercus nigra*, L., and *Q. Phellos*, L., which grew in company with them.

Since the date of the discovery of the trees, two other excursions have been made to the locality by members of the Torrey Club, and the result has been a confirmation of the impression first formed, and all who have seen them are of the opinion that they are hybrid forms between the black-jack and willow-oaks, and, as such, have not been noticed in our botanical literature up to the present time, as far as I can ascertain.

The number of trees observed was about ten, of widely different ages, indicating either that the process of hybridization has been in progress at different times, or, that if it all took place the same season, some of the acorns have germinated sooner than others.

The outlines and modes of venation of the leaves of the new hybrid are exactly represented in the accompanying plates. These show the principal variations towards the unlobed or slightly lobed leaves of typical *Quercus nigra* L., and the much-lobed leaves of what Dr. Engelmann regards as a juvenile, sterile state of the same tree, but which is often seen in large fruiting specimens—the *Q. ferruginea* of Michaux. These leaves vary in outline from lanceolate or oblong unlobed leaves (Figs. 2 and 6), not unlike those of *Q. imbricaria*, Michx., to those where a slight, obtuse lobe appears on one side (Fig. 3); or slight on one side and more pronounced on the other (Fig. 4); or well marked on both sides (Figs. 5 and 7); or obtuse on one side and acute and bristle-pointed on the other (Fig. 9); or acute and bristle-pointed on both sides (Fig. 10), to the leaves of *Q. nigra*, L. (Figs. 8 and 11). It appears as though the specimens reproduced on Plates x and xi were transitions towards the slightly lobed or unlobed *Q. nigra*, L., while the two lower figures on Plate xii indicate transitions towards the more lobed forms; and the figures have been grouped with regard to this fact. The petiole is also seen to vary, though not very prominently shown in the leaves figured, from very short in *Phellos* to a considerable length in *nigra*. The amount of pubescence on the lower surface of the leaves, very slight or absent in *Phellos*, varies on leaves of the hybrid to the heavy, rusty covering of *nigra*.

The acorns vary considerably. Those of *Phellos* are nearly globular, with a low, saucer-like cup (Fig. 1 in the cut); in *nigra* ovoid or oblong, with a top-shaped cup (Fig. 5). In the hybrid they vary on the different trees; the one represented in Fig. 2 came from the tree bearing the leaves figured 2 and 3 in Plate x; it is seen to be slightly longer than the acorn of *Phellos*, and to have a slightly deeper cup with broader scales. The acorn represented in Fig. 3 grew with leaves like those figured 4, 5, 6 and 7; this is much deeper-cupped and longer, with broader scales. The trees which bore leaves like those figured 9 and 10, had acorns like the one represented in Fig. 4 of the cut. This is short-ovoid in shape, with a very wide broad-scaled cup, and does not seem to be intermediate between those of the parents, but is peculiar to itself.

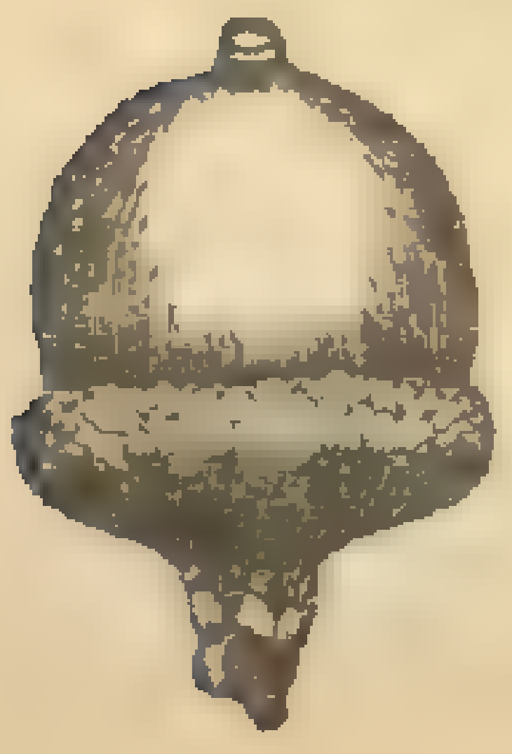
Fig. 1.

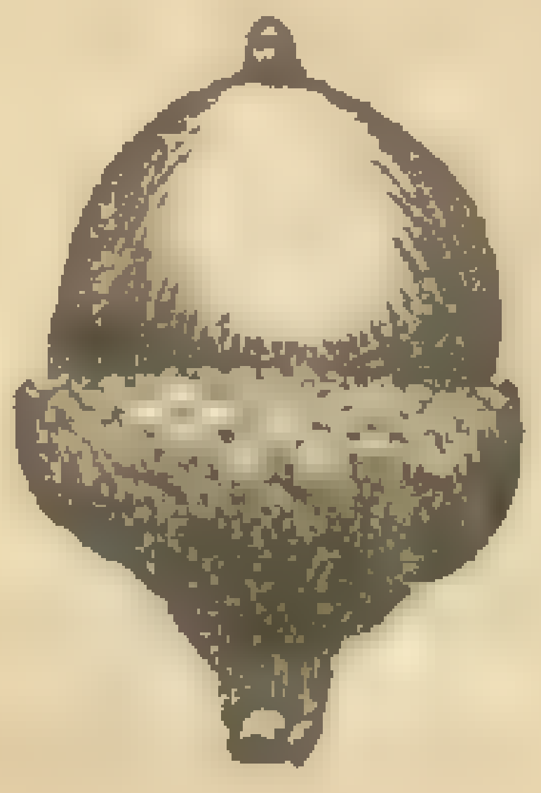
Fig. 2.

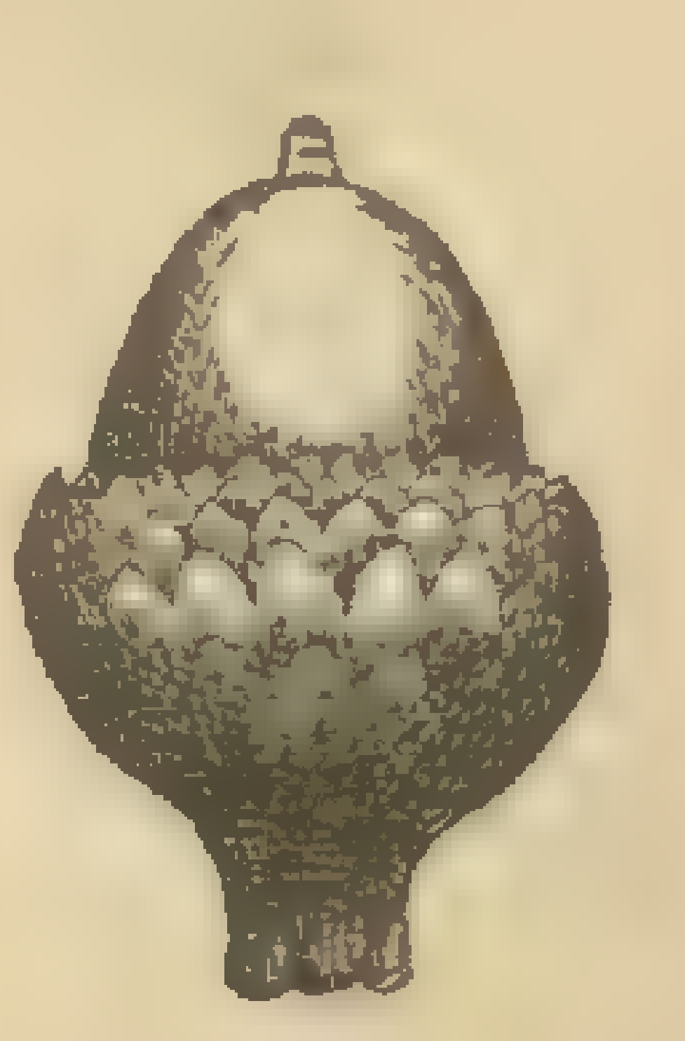
Fig. 3.

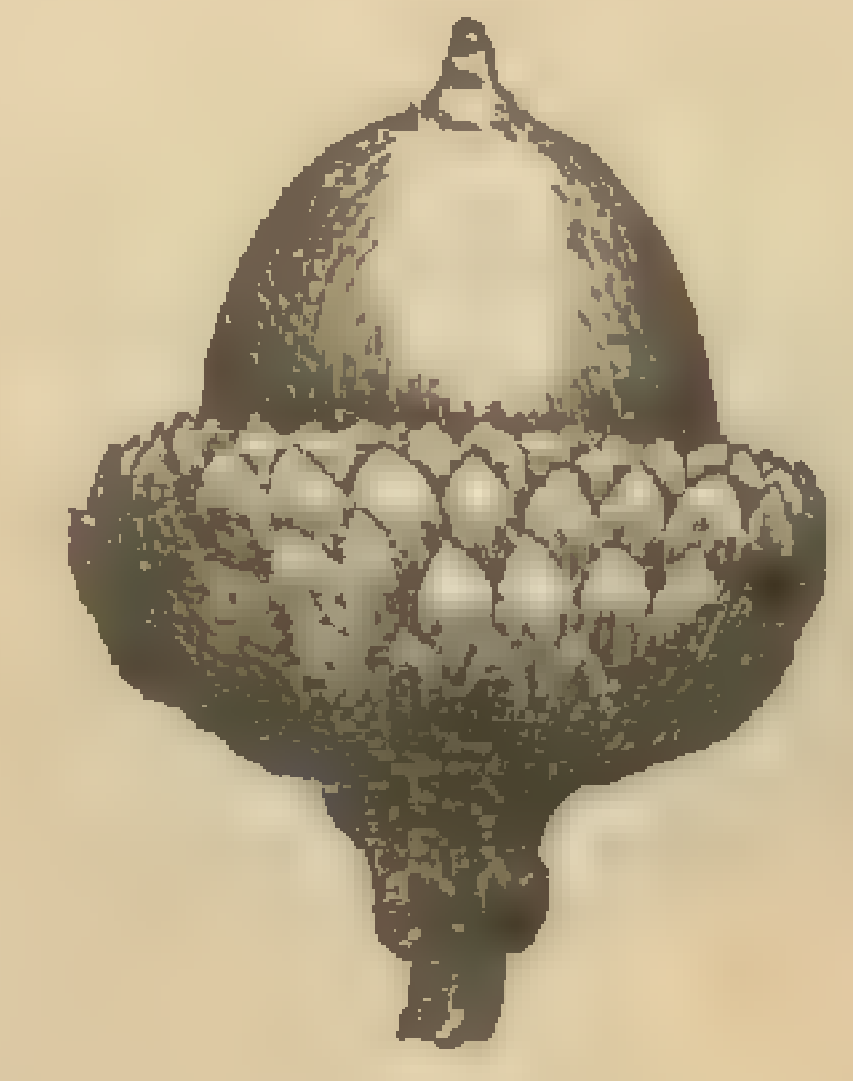
Fig. 4.

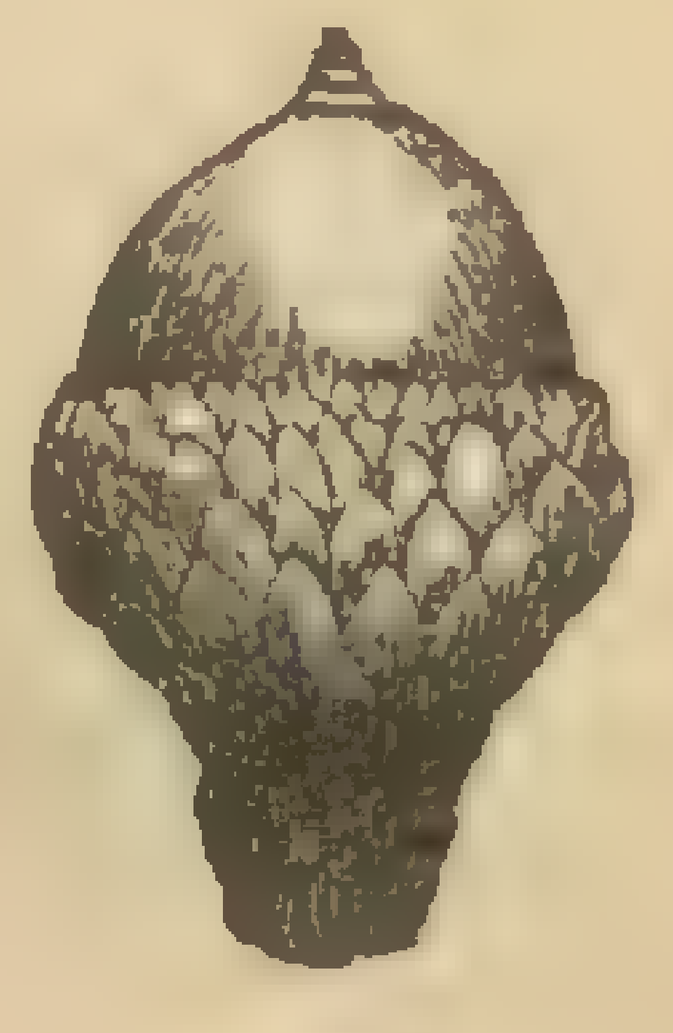
Fig. 5.

The primary venation, which is simply pinnate, with short veins in *Phellos*, and irregularly-pinnate, with veins of very unequal length in *nigra*, presents every variation between the two in the leaves of the hybrid.

The Plates do not represent, by any means, all the variations which were found; but are only intended to illustrate the most common forms which occur.

The bark of the hybrid trees is most nearly like that of *nigra*, being black and quite rough, though varying somewhat in the different trees.

I have thought it not improper to name this hybrid oak—probably the plainest of them all—after the gentleman who first discovered it, Mr. W. H. Rudkin.

In connection with this subject, I take the liberty of making the following extracts from Dr. Geo. Engelmann's paper on *" The Oaks of the United States," in order to enumerate the hybrids already noticed in this country. Dr. Engelmann says: "White oaks and black oaks are too distinct to be crossed. * * * Among the white oaks, hybrids seem to be much rarer than among black oaks. Of the former, I have thus far been able to trace but 3 forms only, which I take to be hybrids, and all of them point to *Q. alba* as one of the parents.

Q. alba x *macrocarpa* is sent by M. S. Bebb from Northern Illinois.

Q. alba x *stellata*. A specimen from the same careful observer must, I believe, be referred here.

Q. alba x *Prinus*. A single tree, now unfortunately destroyed, was observed by Dr. G. Vasey near Washington.

The hybrid black oaks are much more numerous or * * * more have thus far been noticed. * * * Our black oak hybrids are the following :

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* *Trans. St. Louis Acad. Sci.*, Vol. iii, Nos. 3 and 4.

Q. Catesbaei x *aquatica* ; *Q. sinuata*, Walt. It is quite probable that in the tree observed by Dr. Mellichamp, * * * near Bluffton, S. C., we meet with Walter's obscure and long ignored species.

Q. Catesbaei x *laurifolia*, a late discovery of Dr. Mellichamp, is found in the same neighborhood.

Q. imbricaria x *nigra* ; *Q. tridentata*, Eng. in Hb. A single tree, rather small * * * was found by me in the autumn of 1849 on the hills 6 miles east of St. Louis.

Q. imbricaria x *palustris* was observed by me a few years ago, 8 miles west of St. Louis.

Q. imbricaria x *coccinea* was first described and figured by Nuttall about thirty years ago under the name of *Q. Leana*. The original tree was discovered by Mr. T. G. Lea near Cincinnati, and is still in existence.

Q. ilicifolia x *coccinea*, Robbins, discovered by Dr. Robbins at Uxbridge, Mass., in 1855."

Quercus heterophylla, Michx., regarded by Dr. Engelmann as a hybrid between *Q. Phellos* and *coccinea*, or some other oak with deeply lobed leaves, is considered by Mr. I. C. Martindale,* who has given the matter much careful study, to be worthy of specific rank, and is excluded from the foregoing list.

New Species of Compositae chiefly Californian.

By Edward Lee Greene.

VIGUIERA PARISHII.—Shrubby, much branched and scabrous-hispid ; leaves mostly opposite, an inch or two long, including the short petiole, ovate, acute, the margins with a few coarse triangular teeth ; flowering branches long and flexuose, nearly naked above, and each bearing a single head ; involucre short, its scales ovate-lanceolate ; rays about 10 ; receptacle convex ; bristle-like awns of the pappus about equalling the finely ciliate akenes, and deciduous ; the intervening scales apparently persistent, numerous and acute.

Collected at San Luis Rey, April, 1881, by the Messrs. Parish (No. 963).

Dr. Gray writes that he has the same from the Colorado Desert, collected by Mr. W. C. Wright.

HEMIZONIA (HARTMANNIA) HEERMANNI.—Near *H. virgata*, but densely short-hirsute and very viscid-glandular throughout ; stem 1–3 feet high, parted below the middle into many graceful wand-like, loosely racemose or racemose-paniculate branches ; cauline leaves an inch or more long, linear, entire, those of the sterile branchlets oblong-linear, 2–3 lines long and crowded, of the flowering ones still smaller, bract-like, ovate-oblong, scattered and more or less appressed, each tipped with a truncate gland which is nearly or quite sessile ; heads of medium size ; rays 5–8, broad, 3–4-toothed, bright yellow and showy ; disk-flowers 10–15, their corollas glandular ; fertile akenes black or nearly so, more or less tuberculate, and with a prominent curved beak; sterile ones half enclosed by the chartaceous chaff of the flat receptacle.

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* Notes on the Bartram Oak, *Quercus heterophylla*, Michx., by Isaac C. Martindale, Camden, 1880.

Tehachapi Pass, Kern County, near Keene Station, abundant in groves of *Quercus Douglasii*; collected by Dr. Parry and the writer, Sept. 9, 1881.

An interesting discovery, as being a near relative of the peculiar *H. virgata*, Gray, from which species it differs by its habit, pubescence, sparse foliage, larger heads and dark tuberculate akenes.

I distributed too early, a few specimens of this fine novelty under the name *H. parvifolia*, n. sp., and Dr. Gray, having seen one of these, kindly informs me that a fragment in his herbarium, collected by Heermann and referred by Durand to *H. macradenia*, and another collected by Rothrock (No. 176) and by that author referred to *H. ramosissima*, both of which Dr. Gray had put in with *H. virgata*, are of this present species. At the suggestion of Dr. Gray I dedicate the species to Dr. Heermann who first collected it, the name at first proposed being hardly a distinctive one.

✓ HEMIZONIA (HARTMANNIA) PARRYI.—Simple below, corymbosely branched above, rigid, a foot or two high, sparingly hirsute and minutely glandular, the glands yellow, resinous, and nearly sessile; cauline leaves remotely pinnatifid or toothed, those of the branches entire, linear-subulate, rigid and, with the long involucral bracts, spinulose-tipped; rays numerous, exceeding the disk, linear-oblong, 2-toothed; akenes black and smooth, the sterile ones of the disk bearing a pappus of about 3 (rarely 4 or 5) narrowly-linear chaffy scales which taper to a slender point and equal, or even exceed the corollas; chaff of the convex receptacle thin, villous on the margin, acute, obtuse, or sometimes with a resinous-glandular tip, but never at all pungent.

At the Calistoga Springs in the upper part of Napa Valley; collected by Dr. Parry and the writer June 30, 1881, and, again in July, maturer and better specimens by Dr. Parry. Since this description was written Dr. Gray has sent word that the species has long existed in the Cambridge herbarium, being Dr. Torrey's No. 243 from Napa Valley, and Bolander's No. 2614 from Clear Lake, and that it had been referred as a variety to *H. Fitchia*, Gray.

In aspect it is almost precisely like *H. pungens*, T. & G., from which its fragrant, balsamic glandulosity, remarkable pappus, soft chaff and black akenes abundantly distinguish it.

Hemizonia luzulaefolia, DC., var. LUTESCENS, differs from the ordinary, and hitherto only known form of the species in having bright yellow leaves. It grows in great abundance toward the north end of San Francisco Bay, in the vicinity of San Pablo, and at Valejo, where it seems to altogether take the place of the white-flowered type.

HEMIZONIA (CALYCADENIA) SPICATA.—Slender, a foot high, simple or branched, setose-hirsute; heads sessile, spicately crowded on the whole length of the stem and all the branches; flowers white: ray-akenes densely clothed with long, appressed, villous hairs; those of the disk less silky and with a pappus of 10 unequal, subulate, awn-pointed scales.

Collected at Milton Station, in the neighborhood of Stockton, Oct., 1881, by Dr. Parry.

The specimens are rather old and quite destitute of leaves; but the densely spicate heads, and very silky akenes indicate a good species, to come in between *H. Douglasii* and *H. multiglandulosa.*

It is glandular, after the manner of the group, and exhales an odor more agreeable than that of either of the aforenamed species.

✓ Chaenactis santolinoides.—A cespitose perennial, the stems; less than a span high, and, with the foliage, densely white-woolly; leaves linear to linear-lanceolate in outline, 1–2 inches long and 1–3 lines wide, somewhat quadrangular with the numerous, small, crowded and imbricated leaflets; heads large, solitary, on naked peduncles 5–8 inches high; corollas apparently white; pappus of 10–15 very unequal, oblanceolate scales. ✓

Collected by S. B. and W. F. Parish (No. 1045) in the San Bernardino Mountains, August, 1881.

Only two or three specimens were obtained and these long past their flowering. A few ripe akenes were detected adhering to the woolly and matted leaves, from which the peculiar character of the species was made out. It is near to *C. Douglasii* and *C. Nevadensis*, but differs from them, and all other known species, in its very numerous and very irregularly-unequal pappus-scales.

✓ Raillardella Pringlei.—Stem a foot and a half high, leafy at base, naked and glandular above, leaves linear, glabrous, 3–4 inches long, some of the radical ones remotely and obscurely serrate; head solitary, terminating the long scape-like stem, large (an inch high and about 40-flowered), with about 10 broadly cuneate, deeply 3-cleft rays of a deep yellow or orange-color; scales of the involucre distinct to the base; rays fertile, and bearing a pappus similar to that of the disk-florets, of about 15 rather slender and soft plumose bristles equalling the disk-corollas.

High mountains west of Mt. Shasta; collected by C. G. Pringle, in August, 1881.

Dr. Gray, in Bot. Cal. 1, 618, in describing his *Raillardella Muirii*, looked on it as constituting a well marked second section of the genus, distinguished from the first by its leafy stem, and involucral scales distinct to the base. The species now described appears to destroy Dr. Gray's proposed sections, inasmuch as it combines the naked, scape-like, monocephalous stems of the first, with the distinct involucral scales of the second. But *R. Pringlei* surprises us with large, showy ray-flowers, which, however, ought not to have been so unexpected, for in some of Dr. Bolander's duplicates of *R. scaposa*, I find a few rays; but they are smaller, and of a paler yellow than those of this new species.

Hieracium aurantiacum has been collected here for the past two seasons, but always in situations which seemed to indicate that it was an introduced species. It has been found growing on Prospect Hill (a hill situated in the centre of the city and but thinly settled), in open lots and by roadsides, in the grounds of Yates' Castle and in Oakwood Cemetery; but nowhere else that any of us members of the S. B. C. know anything of.

MARY OLIVIA RUST.

New North American Fungi.

By J. B. Ellis.

Paxillus aurantiacus.—Pileus more or less excentric, concave, innate, tomentose, dirty yellow-brown, 1½′–2¼′ across, margin involute when young, expanded when mature; flesh dirty yellowish-white, compact in the centre; lamellae bright orange, paler at first, deepening to orange-red when dry, decurrent, 4–6-times forked, edges entire, obtuse, scarcely exceeding ⅛′ wide, moderately crowded; stem solid, spongy, short, 1′ long by ⅛′–¼′ thick, subequal, mostly curved, covered with a short rusty-brown tomentum; spores white, oblong-elliptical, .0002′x.00015′. Pileus subviscose in wet weather.

On moss-covered decaying cedar logs and stumps in a swamp, November, 1881.

Agaricus (Pleurotus) niphetus.—Pileus lateral, subimbricated thin, flabelliform, spathulate-reniform, 2′–3′ wide and long, narrowed to the sessile base, but without any distinct stipe, convex, innate-tomentose, snow-white throughout, becoming yellowish in drying; lamellae narrow, unequal, crowded; spores white, nearly orbicular, .00015′–.000275′ in diameter with a large nucleus, or two or three small ones.

On decaying logs and stumps of pine and cedar in a swamp, Oct., Nov.

Peziza (Sarcoscypha) aurantiopsis.—Sessile, about one inch across, with a coarse, felt-like, black-brown mycelium at the base, matting together the leaves, etc., on which it grows; the outside of the cup also coated with coarse (.00025′ diam.) brown, smooth sparingly-branched, continuous hairs; disk clear pale yellow, nearly sulphur-yellow, becoming dull orange when dry; margin thin, pale, narrow, erect; flesh white, thick (⅛′–¼′), firm, elastic, dry; asci cylindrical, subtruncate above, .0013–.0014x.0006′; paraphyses stout, septate, slightly thickened above; sporidia oblong-elliptical, granular, .0009′–.001′x.0006′, epispore smooth.

On the bare soil and on decaying wood and leaves in low, sandy, oak and pine woods, Sept. 1881.

Peziza (Sarcoscypha) scutelloides.—Sessile, ⅕′–¼′ across, outside sparingly clothed, and margin fringed with dark brown, 1–3-septate hairs; disk, bright red, as in *P. scutellata*, L., which this outwardly much resembles; asci cylindrical sessile, .006′x.0007′; paraphyses stout, clavate, thickened above and filled with orange-colored granular matter; sporidia uniseriate, globose, smooth, with a single large nucleus, about .0005′ in diameter.

On damp ground, West Chester, Pa., June and July, 1881, Haines, Everhart, Jefferis and Gray, Nos. 165 and 180.

Peziza (Dasyscypha) latebrosa.—Stipitate, yellowish-white, .015′ high, clothed throughout with short, spreading, glandular hairs; disk concave, .01′ across, dull white, with a faint tinge of rose-color; margin incurved and fringed with straight, rough hairs, faintly septate below, obtuse or slightly enlarged above, and about .002′ long; asci clavate-cylindric, .001′–.0013′ long by .00015′ wide; paraphyses stout, linear, not pointed above; sporidia biseriate, simple, hyaline, .00015′–

.0002′ long. Resembles *P. virginea*, Fr., but that is whiter and taller, with capitate hairs and lance-pointed paraphyses, and has sporidia .0003′ or more long.

On the inside of a moldy pine box in a cellar, June 15, 1881.

PEZIZA (DASYSCYPHA) RHABDOCARPA.—Scattered, sessile, .02′ in diameter, thin and of a close, vesiculose-cellular structure, margin fringed with short, black, fasciculate, obtuse, clavate-capitate hairs; asci oblong-cylindrical, sessile, obtusely pointed above, .0025′x.0003′–.0004′; paraphyses stout, scarcely thickened above; sporidia linear, multinucleate (becoming multiseptate?) yellowish, nearly as long as the asci, and a little over .0001′ thick.

On dead twigs of *Comptonia*, Sept., 1881.

PEZIZA (TAPESIA) PHLEGMACEA.—Gregarious, sessile, orbicular, plane, thin, white, soft, seated on a subiculum of delicate, creeping, white, loosely-matted threads; asci cylindric-clavate, abruptly pointed above, .003′x.0005′; paraphyses scarcely thickened above; sporidia linear-fusiform, attenuated below to a slender point, .0013′x.0001′.

On decaying *Magnolia*, June to Sept.

PEZIZA (MOLLISIA) ABDITA.—Disk orbicular, pale, .028′–03′ in diameter, with a narrow, jagged, membranaceous margin, protruded when fresh through a narrow slit in the epidermis, from which it is again withdrawn and entirely disappears when dry; asci sessile, oblong-cylindrical, .0015′–.002′x.000175′–0002′; paraphyses thickened above; sporidia biseriate, clavate-oblong, about .0004′x.0001′. Resembles *P. protrusa*, B. & C., in habit. When dry its presence is indicated only by a narrow slit in the epidermis.

On fallen petioles of *Juglans regia*, June.

DIATRYPE LATERITIA.—Seated in the bark and not penetrating to the wood, which is not marked or discolored by it at all. Stroma at first concave and of a dull brick-red color, at length convex and olivaceous with a distinct margin like a *Helotium* ⅛′–¼′ in diameter, thickly dotted with the papiliate, black ostiola; perithecia carnose-cartilaginous, small and numerous (50–75) in two layers near the surface, leaving the lower part of the stroma entirely barren; asci clavate-cylindrical, .004′x.0003′; sporidia overlapping, lanceolate, curved, pale brown, 3-septate .0008′–.001′x.0002′.

On dead limbs of *Carpinus* (?), West Chester, Pa., Aug. 1879, Haines, Everhart, Jefferis and Gray, No. 2.

LOPHIOSTOMA VERMISPORA.—Perithecia scattered or subgregarious, depressed-spherical, .006′ in diameter, seated under the epidermis, which is pierced by the stout, black, narrowly-compressed ostiola; asci clavate-cylindrical, .008′x.0005′–.0006′; sporidia vermiform, gradually tapering towards the base, about 7-septate and slightly constricted at the septa, yellowish or nearly hyaline, each of the divisions with 1–2 large nuclei, .003′–0035′ long by .00015′–.0002′ thick.

The sporidia are those of *Ophiobolus* but the compressed ostiolum is that of a *Lophiostoma*.

On old stems of *OEnothera biennis*, August.

DIAPORTHE APICULOSA.—Perithecia buried in the substance of the stem; ostiola rather stout and slightly projecting, so as to roughen the surface of the stem; spore-bearing part of the asci

.0016′–.0003′ ; sporidia biseriate, yellowish, elliptical, 2–3-nucleate, with a faint apiculus at each end, .00035′–.0004′x.000175′. Grows only on the root and basal portion of the stem.

On decaying stems of *Erigeron Canadense* lying on the ground, Aug.

Asterina ramularis.—Perithecia subcuticular, orbicular, .0008′–.001′ in diameter, or subelongated, scattered or subconfluent, with a very scanty mycelium ; margin of a distinct radiate-cellular structure ; asci oblong, spore-bearing portion .002′x.001′, stipitate at first, stipe at length absorbed ; sporidia 8, crowded, elliptical, coarsely granular, with 1–2 large vacuoles at first, about .0006′x.0004′.

Perithecia permanently covered by the epidermis, which is blackened above them.

On dead twigs of *Lindera Benzoin*, West Chester, Pa., Oct. 1881, Haines, Everhart, Jefferis and Gray, No. 326.

Nectria squamulosa.—Gregarious, minute, .004′ in diameter, ovato-globose, covered, excepting the brownish, obtuse, slightly prominent ostiolum, with a light-colored, squamulose coat ; asci lanceolate, narrowed and subtruneate above, .0013′x.00025′; sporidia biseriate, clavate or cylindric-oblong, .0002′–.0003′ long by rather less than .0001′ wide, binucleate, probably becoming uniseptate.

On decaying wood of a fallen limb, No. 81.

Ceratostoma capillare.—Perithecia capillary, nodulose, with short, spreading, hyaline hairs below, scarcely enlarged at base ; asci elliptical, .0013′x.00035′; sporidia 8, crowded, fusiform, nearly hyaline, indistinctly nucleate, straight or slightly curved, .00045′–.00055′x.000125′.

On decaying sterile catkins of *Alnus serrulata*, June.

Dinemasporium cruciferum,—Minute ; marginal fringe of dark brown bristle-like hairs, .003–0035′ long ; spores pale flesh-color in the mass, oblong, slightly curved, .0003′–.00035′x.000125, with a slender, oblique, bristle-like hair, about as long as the spore itself, projecting from each end, and a shorter one from near the middle of the convex side, and often another extending in an opposite direction from the middle of the concave side. Sometimes two hairs project from the convex side of the spore.

On decaying culms and leaves of various grasses, June.

Volutella comata.—Receptacle disciform, orbicular, .0017′–.002′ in diameter, attached by a central point and easily separating from the matrix ; margin fringed with slender, septate, minutely-roughened, slender-pointed hairs ; mass of spores flesh-colored, and convex when fresh ; spores fusiform, .0005′–.00035′ long. Differs from *V. ciliata*, Berk., in its larger spores.

On fallen petioles of *Robinia*, June.

Unless otherwise stated, the above-described species were collected at Newfield, N. J.

Fern Notes. III.

By Geo. E. Davenport.

Asplenium ebenoides in New York State.—The discovery of this rare fern near Poughkeepsie was recorded by Mr. Clarence Lown in the Bulletin for September, 1880. Mr. Lown, in company with

Mr. Henry Booth, has now had the good fortune to find another plant of the same species in the limestone region of Saugerties, in Ulster County.

The plant was found on the 15th of November, 1881, *growing in a clump of Camptosorus.*

Mr. Lown writes that the limestone-loving ferns *Asplenium Ruta-muraria* and *Pellaea atropurpurea* were plentiful in the vicinity, but that there was no *ebeneum* nearer than fifteen feet. That distance, however, is plenty near enough (as, indeed, a much greater distance would be), to admit of the intermixture of spores, and consequent hybridization, if to that source the origin of *ebenoides* is really to be attributed.

In the specimens previously recorded, Mr. Lown described the venation as being more or less anastomose. This is the case in the frond which I received from Mr. Lown at that time, and also in at least one of my specimens from Alabama; but in the present plant the venation is everywhere free, while the plant itself looks very much like a form of *A. pinnatifidum* (a species not yet, but which ought to be, found within the limits of New York State) with black stipites, the tips of the fronds being less prolonged than usual.

It is to be hoped that some one, with means and opportunities for investigation, will yet be able to settle the question of this fern's origin; for, while the evidence is strongly in favor of the hybrid theory, it is by no means conclusive.

In view of the possibility of such an investigation the following points are presented here as having an important bearing upon the question:

1.—In every instance thus far, wherever *ebenoides* has been found, *Camptosorus* and *Asplenium ebeneum* have both been present.

2.—The affinity of certain characters possessed in common by *ebenoides* and *Camptosorus*—the prolonged, attenuated proliferous apices, anastomosing venation (BULLETIN *l. c.*), and now the significant position in which Mr. Lown found his last plant—point to *Camptosorus* as the mother plant; while, on the other hand, certain characters possessed in common by *ebenoides* and *Asplenium ebeneum* —the deeply pinnatifid, sometimes nearly, or quite pinnate (at least below) laminae, and ebeneous stipites—point to the latter species as the probable source from which hybridization proceeded: the inference from these facts, and the constant presence of *A. ebeneum* and *Camptosorus* being that the prothallus of some *Camptosorus* had become fertilized from the prothallus of an *ebeneum*, resulting in the production of a hybrid combining in itself the characters of both species.

3.—The extremely variable and irregular form of *ebenoides*—the often grotesque variation appearing as the result of two opposing internal elements struggling for the mastery—is exactly what might be expected from the hybridization of the two ferns mentioned.

Aspidium Filix-mas, Swz., *in Arizona.*—The discovery of *Cheilanthes tomentosa*, Link., *Aspidium patens*, Swz., and *Woodwardia radicans*, Smith, in Arizona, by Mr. C. G. Pringle, has already been recorded in the BULLETIN for August, 1881; I am now able to record the additional discovery of *Gymnogramme triangularis*, Kaulf., and *Aspidium Filix-mas*, Swz., by the same indefatigable collector. The first was collected in April on the Santa Catalina, and the last on Mt. Washington, in the Santa Rita Mountains, in June, 1881.

This discovery of *A. Filix-mas* so near to California renders its presence in that State probable, and will encourage California botanists to search for it. Some forms of *A. rigidum*, var. *argutum* run very near to, and have frequently been mistaken for it, but no authentic specimens have as yet been received from California.

The species is most readily distinguished from *argutum* by the character of the serrated margins, these *never being spinulose* as in the latter species, which resembles *A. spinulosum* in this respect more than it does *Filix-mas*.

The under surface is usually more chaffy in *Filix-mas* than in *argutum*, the laminae narrower below, and the scales at the base of the stipes more or less ciliate-toothed, as pointed out by Prof. Eaton in his splendid work on our North American Ferns.

Mr. Pringle has also collected in Arizona, besides the ferns already mentioned, *Notholaena Grayi*, *N. Lemmoni*, *Gymnogramme hispida*, a very pubescent form of *Pellaea atropurpurea*, *Cheilanthes Lindheimeri*, *C. Fendleri*, *C. Eatoni*, and others,* while among his ferns from Oregon and California are *Polypodium falcatum*, very large forms of *P. Scouleri*, *Phegopteris alpestris* and *Aspidium Mohrioides*.

The excellence of Mr. Pringle's collections is now too well known to need any special commendation. He will probably make some arrangement before returning to the Pacific Coast (being at Charlotte, Vermont, at present) by which those who may desire sets of his ferns can obtain them.

An unusual form of Asplenium ebeneum.—From Miss Kate Furbish, of Brunswick, Me., comes a very interesting form of this species, one frond, measuring about 12 inches in length by 2 in breadth across the middle, and having unusually narrow, deeply-serrated pinnae, 1 inch long, less than ⅕ of an inch in breadth at the base, broadening to about 3 lines at the centre where they are still more deeply serrated, the lobes again serrated, and then tapering gradually into an acute tip. The pinnae are obliquely set to the rachis, and some of them lose their auricled bases altogether.

The specimen is apparently one of those variations which are not likely to occur twice upon the same plant, and it does not, therefore, seem worth while to give it a name. Miss Furbish is rendering a splendid service to the Maine flora by a series of admirably executed and accurate analytical illustrations from nature, intended to include the entire flora of the State. It is to be hoped that she will not only be able to complete her "labor of love" but that it may some day be placed where it will remain as a monument to her untiring industry and love for the wild plants of her native State.

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* Mr. Pringle also collected, early in 1881, a few specimens of the *Woodsia* which Prof. Eaton has referred to *W. Mexicana*. Later, Mr. Lemmon sent the same fern to me with the name *W. Plummerae* attached, with a request that I should describe and publish it. This I declined to do. If now the fern which he has published as a new species in the *Botanical Gazette* under that name is the same plant, then it is to be seriously challenged, and I do not believe it will stand. The same *Woodsia* had previously been collected by Mr. Rusby, Mrs. Bagg, Dr. Palmer and Dr. Parry.

Abnormal Botrychium matricariaefolium.—While looking over some duplicates recently I came across a specimen of this fern with a fertile branch growing out from the stipes about 1 inch from its base. The branch had grown out in such a manner as to cause the stipes to diverge from its proper perpendicular course, and to form a curve which gave it the appearance of being forked.

Medford, Mass., Jan. 12th. 1882.

Large Grape-Vines.—In the January BULLETIN, Prof. Bessey gives the measurement of a grape-vine in Wayne Co., Ohio, (supposed to be *V. Labrusca*) of thirty-seven inches in circumference at four feet from the ground. In March last, whilst in Darien, Ga., I rode out to Baisden's Bluff on the coast, some twelve miles N. E. of Darien to see a celebrated grape-vine. It was just in leaf, but from the wood and bark I judged it to be *V. aestivalis.* It grew near to (touching) a large water-oak, and the large trunks clambered up to the top of the tree. I measured it at eight feet from the ground, and found it forty-four inches in circumference. I also measured, in the streets of Darien, two large live oaks, one giving a circumference of twenty-one feet, at three feet from the ground, and the other, eighteen feet at the same distance. I also measured two trees of *Melia azedarach* (pride of India) one eleven and a half feet, the other nine and a half feet, both taken about three feet from the ground. This exotic is a fast grower but the large size proves that this tree must have been introduced in the early settlement of the State.

Aiken, S C. H. W. RAVENEL.

Notes on the Flora of Newport, R. I.—During the past season I have found a few interesting plants at Newport, R. I. A small patch of *Rhinanthus Crista-galli* grows in a swamp about a mile S. W. of the city. It was probably introduced here.

Epilobium hirsutum, L., is not uncommon in waste ground surrounding dwellings.

Genista tinctoria, L., occurs sparingly on some rocky hills, and *Trifolium hybridum*, L., in fields near the sea-shore. *Iris Virginica*, L., grows abundantly in swamps. *Alopecurus geniculatus*, L., and *Leontodon autumnale*, L., are found everywhere. *Hydroctyle umbellata*, L., grows in shallow water on the border of Lily Pond. *Bromus mollis*, L., is found in great abundance in a piece of ground near Bellevue Avenue. It grows in such profusion that at a distance it might be taken for a field of grain. The following species also occur here: *Potentilla anserina*, L., *Glyceria acutiflora*, Torr., *Phalaris Canariensis*, L., *Bromus tectorum*, L., *Galinsoga parviflora*, Cav., *Centaurea nigra,*, L., *Clethra alnifolia.*, L., *Euphorbia Peplus*, L., *Triglochin maritimum*, L., *Arethusa bulbosa*, L., *Habenaria lacera*,

R. Br., *Polygala polygama*, Walt., *Ranunculus Cymbalaria*, Pursh. *Lathyrus palustris*, L., and *Discopleura capillacea.*, DC.

Newport, R. I., Dec. 22, 1881. FRANK TWEEDY.

The White-fruited Blackberry.—In the November BULLETIN G. M. Wilber speaks of finding a white-fruited specimen of *Rubus villosus*, Ait., in New York. This anomaly was found quite commonly on the high lands along the Michigan lake shore at South Haven, Mich., when the country was first settled. It was transplanted to gardens in many places and has spread vigorously under cultivation for many years, constantly maintaining its original character. The fruit is every way equal to the typical black-fruited blackberry, but is inclined to be somewhat sweeter. It is generally known as the "white blackberry." The whole aspect of the plant is peculiar and striking. It deserves to be recognized as a variety in our botanies.

Lansing, Mich., Dec. 29th, '81. L. H. BAILEY, JR.

Proceedings of the Torrey Club.—The regular meeting of the Club was held at the Herbarium, Columbia College, Tuesday evening, Jan. 11th, the President in the chair and twenty-two members and five visitors present.

Plants Exhibited.—Dr. Barstow exhibited specimens of fruit and leaves of the Japanese persimmon, *Diospyros Kaki*, and flowers of Irish furze. Mr. Charlton sent a collection of plants for the Club's inspection and for deposit in the herbarium. Miss Knight showed several specimens of mosses in fruit, among which was the rare *Buxbaumia aphylla*, Haller, collected at Dedham, Mass.

Some Notes on the Flora of Newport, R. I., by Mr. Frank Tweedy, were read by Mr. Britton.

Mr. Schrenk read a paper on the "Development of the Rootstock of *Dicentra*."

Late Flowers.—Mr. Bicknell stated that he had obtained in flower at Riverdale, between Dec. 25th and Jan. 1st, *Taraxacum Dens-Leonis*, *Callitriche verna* and *Verbascum Thapsus*.

The Constitution and By-laws, as amended at a previous meeting, were passed, and ordered printed in pamphlet form.

One name was proposed for active, and one for corresponding membership.

Election of Officers.—This being the annual meeting, the Club balloted for officers with the following result: President, J. S. NEWBERRY; Vice-President, ADDISON BROWN; Recording Secretary, G. M. WILBER; Corresponding Secretary, BENJAMIN BRAMAN; Treasurer, W. H. RUDKIN; Editor, W. H. LEGGETT; Associate Editor, W. R. GERARD; Librarian, N. L. BRITTON; Curator, P. V. LE ROY.

The President appointed Messrs. Leggett and Gerard a committee on admission of members.

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New Fresh-water Algae.

Fig. I

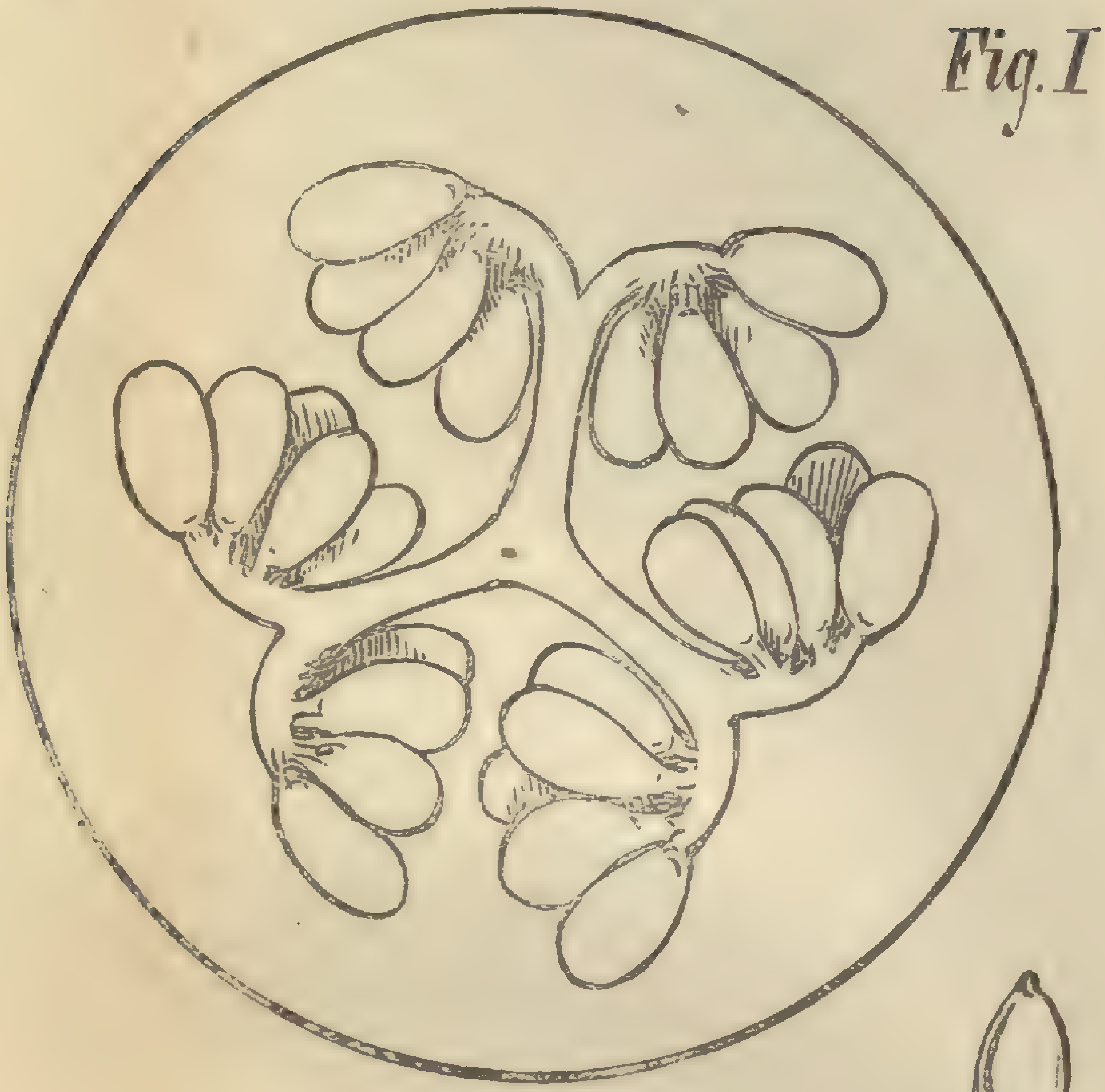


Fig. 2

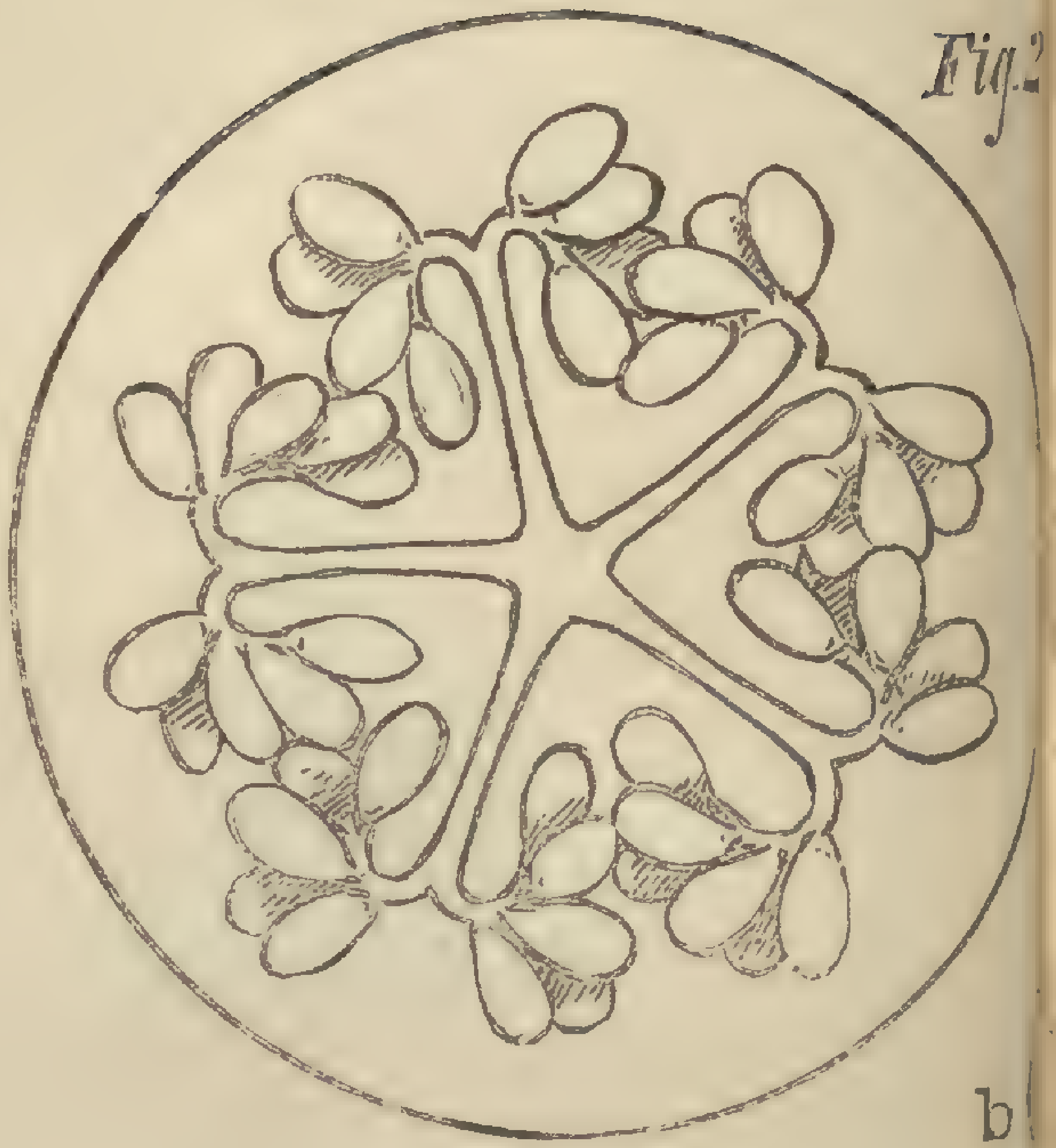


Fig. 4

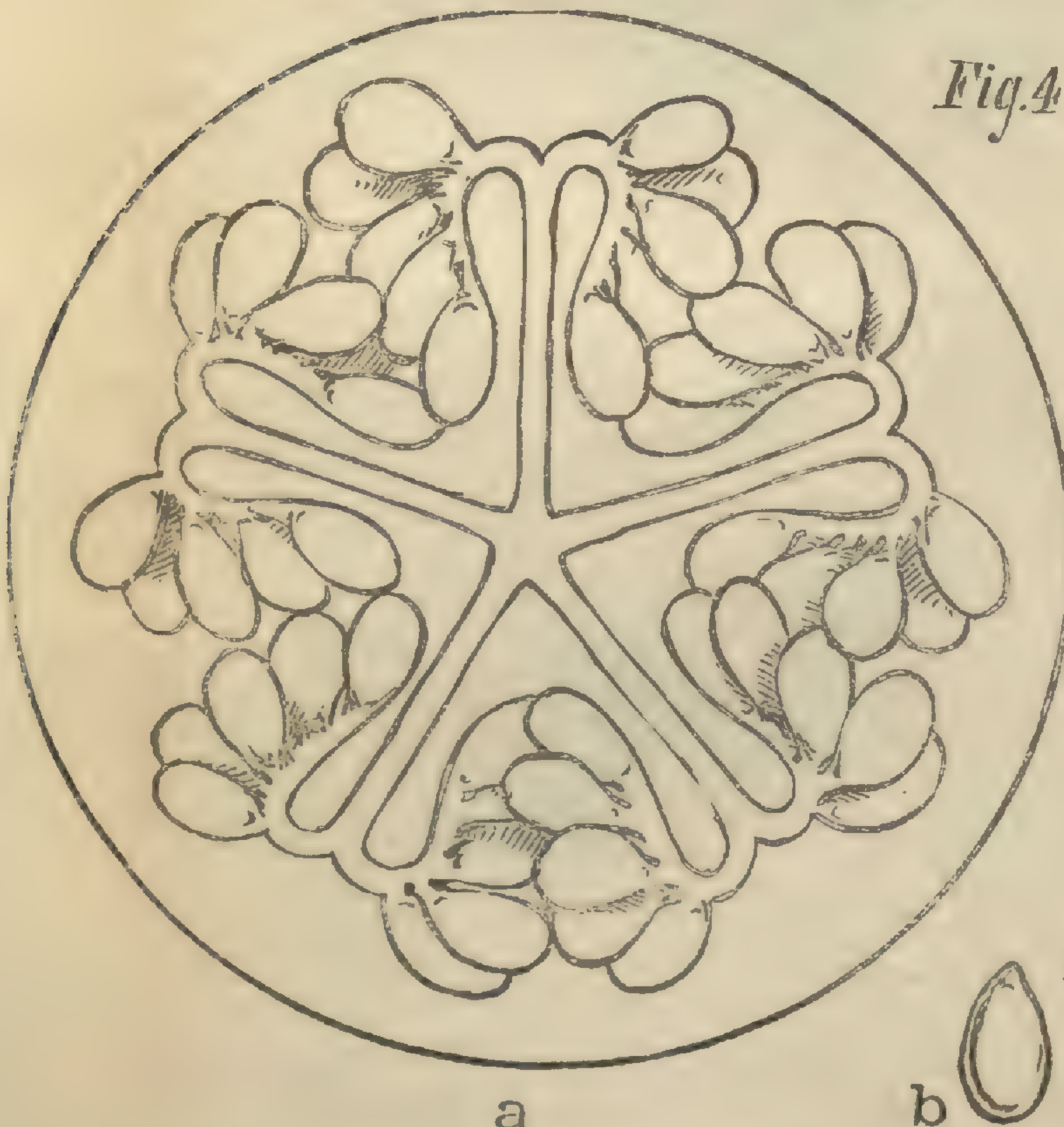
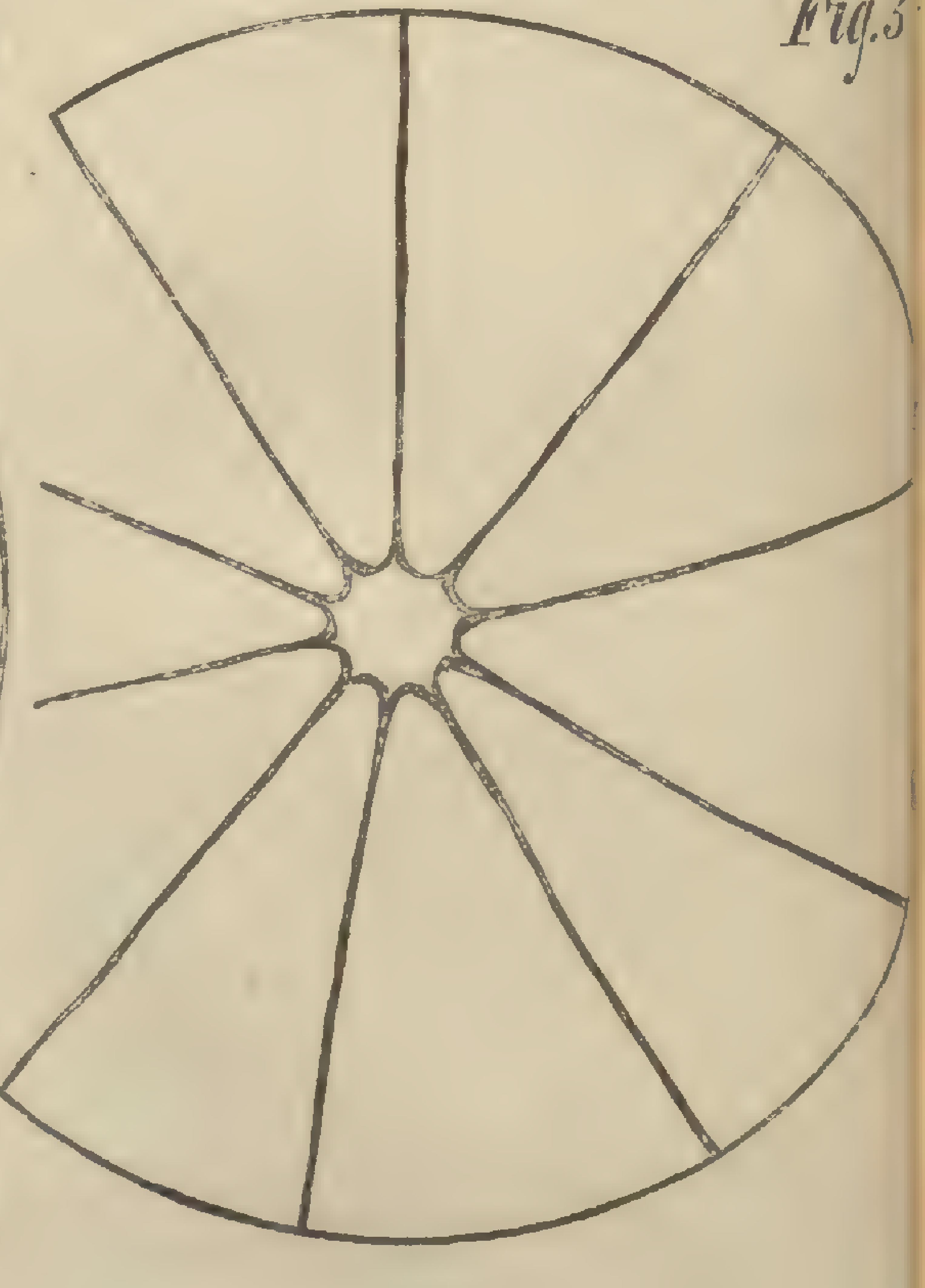


Fig. 3



FRUITS OF CUCURBITA.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. IX.] New York, March, 1882. [**No. 3.**

Fresh-Water Algae. VI.

By FRANCIS WOLLE.

(Plate XIII.)

The following is a partial list of fresh-water algae collected by myself and by interested contributors during the past summer (1881). The addition to the recognized forms of the algae of the United States is not so large as that made in some previous years; nevertheless it indicates that our waters have not yet been fully explored. More forms ought to be found; indeed, some genera are not as yet represented. Why do we find no *Sphaeroplea*? Good forms of *Prasiola* have not yet occurred, except from the Rocky Mountains; while less conspicuous forms, well known in Europe, are also wanting.

GOMPHOSPHAERIA, Ktz.—*G. aponina*, Ktz., var. CORDIFORMIS, *n. var.* (Plate XIII, Fig. 11). G. thallo primario laete aeruginoso, deinde pallide aurantiaco, vel expallescenti; tegumentis achromaticis, subcrassis; cellulis numerosis, densis; cellulis marginalibus distincte cordiformibus, paullo longioribus quam latioribus; cellulis in medio, a vertice visis, bicocciformibus; cytioplasmate granulato aerugineo vel expallescente. Diam. cellul. .0005″–.0006″; long. .0006″–.0008″; crass, .0003″–.0004 .

Hab. Small ponds near Bethlehem, Penn.

This plant differs from *G. aponina*, Ktz., in the form of the cellules, which are decidedly heart-shaped, not "cuneate." The coenobia and the cellules are fully twice the size of those of the only species described.

SPIRILLUM, Ehrb.—*S. undula*, Ehrb. Hab. Small ponds, Penn.

SPIRULINA, Link.—*S. Jenneri*, Hass. Hab. Ponds, Penn.

OSCILLARIA, Boss.—*O. littoralis*, Carm.; coll. by R. Hitchcock in submarine waters, New York. *O. crassissima*, Rab., in trenches, Penn. *O. detersa*, Stitz.; coll. by Dr. A. Seipt in a pool in Luray Cave, Va., 260 ft. below the surface.

PHORMIDIUM, Ktz.—*P. inundatum*, Ktz., on moist earth, S. Car.; coll. by H. W. Ravenel. *P. tinctorium*, Ktz., coll. by C. G. Pringle, April, in springs, Arizona.

CALOTHRIX, Ag.—*C. gracilis*, Rab., on river stones in shallow water, Penn. *C. affinis*, Menegh., through R. Hitchcock, from Sandwich Islands.

DIMORPHOCOCCUS, A. Br.—*D. lunatus*, A. Br., New Jersey.

PALMODACTYLON, Naeg.—*P. simplex*, Naeg., coll. by R. Hitchcock, in Croton water, New York.

OOCYSTIS, Naeg.—*O. Naegelii*, A. Br., frequent in ponds, Penn. and New Jersey.

PEDIASTRUM, Meyen.—*P. simplex*, Meyen; typical form (Plate XIII, Figs. 1 and 1′; two new varieties, Figs. 1″ and 1‴.) *P. biradiatum*, Meyen; all collected by R. Hitchcock in the New York City supply of Croton water.

SORASTRUM, Ktz.—*S. echinatum*, Ktz., ponds, N. J. and Pa.

GONIUM, Müller.—*G. pectorale*, Mull., in ponds, N. J.

POLYEDRIUM, Naeg.—*P. minimum*, A. Br., in ponds, Penn.

SPIROGYRA, Link.—*Sp. orbicularis*, Hass., abundant in fruit in a small stream, Bethlehem, Pa. *Sp. bellis*, Hass., Budd's Lake, N. J. *Sp. condensata* coll. by H. H. Rusby near Silver City, New Mexico. *Sp. quadrata*, Hass., in river near Bethlehem, Pa. *Sp. setiforme*, Roth., not new except in the condition of the spores, which present the early stages of development. *Sp. fluviatilis*, Hilse. European authors are united in declaring the fruiting of this species unknown. October 8th last I was fortunate in finding the plant in fine fruit in a pond near Bethlehem, Pa.

The diagnosis should be corrected to read, "Sp. saturate viridis, minus lubrica; articulis sterilibus cylindricis, diametro (.1014″--.00159) 2-6-plo longioribus; sporiferis valde tumidis; sporis aut ovalibus aut late ellipticis; diametro .0021″–.0023″; long. .003″–.0033″; fasciis spiralibus 4 sublatis, anfractibus densissimis."

MESOCARPUS, Hass.—*M. depressus*, Hass., Mobile, Ala., coll. by M. S. McNeil. *M. recurvus*, Hass., St. Lawrence River, coll. by I M. Adams.

STAUROSPERMUM, Ktz.—*S. quadratum*, Ktz., in small stream, S. Carolina, coll. by H. W. Ravenel.

RHIZOCLONIUM, Ktz.—RH. HOSFORDII, *n. sp.*—Rh. laete saturate viride, vel luteolo-viride, crispatum, rigidum, filis ramulos breves unicellulares numerosos emittentibus; articulis diametro (0.016″) 2-4-6 plo longioribus; cytiodermate crasso hyalino homogeneo.

Collected near Aurora, N. Y., by F. H. Hosford. It is nearest *Rh. Casperi*, Harw., but is much firmer, nearly twice the size; and is purely a fresh-water plant.

ULOTHRIX, Ktz.—*U. Jurgensii*, Ktz., coll. by H. W. Ravenel in rice-field ditches near Darien, Ga.

CLOSTERIUM, Nitzsch.—*C. Ehrenbergii*, Menegh, var. IMMANE, *n. var.*, differs from the typical form mainly in size. Measures .0083″ diameter, nearly twice the diameter of the largest variety of this genus on record. Collected in Budd's Lake, N. J., Aug. 1, 1881.

COSMARIUM, Corda.—*C. anisochondrum*, Nord., in Denmark Pond, N. J. *C. bireme*, Nord., in ponds, Penn. and N. J. *C. Clepsydra*, Nord., Budd's Lake, N. J. *C. globosum*, Bulnh., in ponds, Penn. and N. J. *C. galeritum*, Nord., in ponds, N. J. *C. Holmiense*, Lund., on Mt. Mansfield, Vt., coll. by F. H. Hosford. *C. nitidulum*, De. Not., coll. by F. H. Hosford. *C. orthostichum*, Lund., in Denmark Pond, N. J. *C. punctatum*, Bréb., Penn., N. J. and Mass. *C. pseudogranatum*, Nord., N. J. *C. quadrifarium*, Lund., Mt. Marcy, Vt. *C. rupestre*, Naeg., Mt. Marcy, Vt. *C. taxichondrum*, Lund., Mt. Marcy, Vt. (The last three were collected by Rev. H. D. Kitchel. The last-named species I have since found not uncommon in New Jersey.) *C. monomazum*, Lund., near var. *polymazum*, Nord., (Plate XIII, Figs. 15 and 15′), but differs in having 6 papillae on each side of the semi-cells instead of 1 on one side and 4 on the other. Denmark Pond, N. J.

COSMARIUM KITCHELII, *n. sp.* (Plate XIII; Fig. 3, front view;

3′, side view; 3″, end view.) C. submediocre diametro quarta parte longius, profunde constrictum; sinu lineari angusto; semicellulis perfecte semicircularibus; angulis inferioribus subrectis, in margine verrucis circiter 18, et intra marginem seriebus 1 vel 2 concentricis verrucarum ornatis; in centro granulis plerumque 6 in series 2 transversas ordinatis; e vertice visis ovato-ellipticis, granulis in medio seriebus 4 ordinatis; utrinque ternis granulis ornatis; a latere visis circularibus, granulis utrinque 2 et in medio seriebus 4 ordinatis. Latitudo isthmi tertia pars diametri transversalis corporis; long. .00133″ (=34μ); lat. .0016″ (=40μ.)

Hab. In a pond, Hammonton, N. J. Collected by Rev. H. D. Kitchel. This species is readily recognized by the end or side view; in the former, by the two large marginal granules, and in the latter by the four rows of smaller central granules.

BAMBUSINA, Ktz.—B. DELICATISSIMA, *n. sp.*—B. fasciis praelongis, nodosis; cellulis cylindricis, diametro (.00023″–.0003″) 4-5-plo longioribus, a medio duabus vittis transversis annuliformibus instructis; annulis plus elevatis quam latis. Trichomatibus, cum annulis, .0006″–.0007″.

Hab. In a pond, Pleasant Mills, N. J.

I have deemed this plant worthy of separation from the usual form: it has only about one-third the diameter of the trichoma proper, the rings are much more elevated, and the length of the cells is usually fully four times the diameter.

EUASTRUM, Ehrb.—*E. inerme*, Lund., and *E. erosum*, Lund., both from ponds in Penn. and N. J. *E. divaricatum*, Lund., in pond, New Jersey.

GONATOZYGON, De By.—G. PILOSUM, *n. sp.* (Plate XIII, Fig. 16.) G. cellulis elongatis diametro 12-20-plo longioribus, laxe connexis, cytiodermate plus minus dense spinuloso; spinis tenuibus, rectis, hirsutis; cellulis cylindricis utroque polo non constrictis, nisi cellulis terminatibus modice attenuatis, polo rotundato. Diam., sine spinis, .0006″–.0006″; cum spinis .001″.

Separated from other forms mainly by the vesture of hairs. Frequent in ponds of New Jersey.

MICRASTERIAS, Ag.—*M. foliacea*, Bailey. Prof. Bailey discovered this plant in Rhode Island more than thirty years ago. After seven years of searching I have at last rediscovered it in Denmark Pond, New Jersey, where it occurs in abundance. Dr. Nordstedt found it in Brazil. Studying from the somewhat imperfect figure, he made a new var. *ornata*. There is no doubt that I have the original form, and that the Brazilian plant is the same. A peculiarity of this species is that it is rarely found singly. The polar lobe projects considerably, and is furnished with two surface teeth. As the plant multiplies by division, these projecting lobes lap over each other and cling together; they are usually found in series of 4-10.

In the same pond are also interesting varieties of *Micrasterias truncata*, Corda., one only .002″ in length and breadth. *M. muricata*, Bailey, occurred frequently last summer, as did also *M. laticeps*, Nord., which is the same as Wood's *disputata* of later date.

STAURASTRUM, Meyen.—*St. muricatum*, Bréb. *St. pecten*, Perty. *St. Brasiliense*, Nord., (first discovery of this plant north of the Gulf States). *St. rotula*, Nord.. (Plate XIII, Fig. 9.) *St. Ophiura*, Lund., in two new varieties, described by the names TETRACERUM, (four-armed) (Plate XIII, Fig. 4.) and PENTACERUM, (five-armed) (Plate, XIII, Fig. 5.) All of these were collected in Denmark Pond, New Jersey. *St. furcatum*. Ehrb., in Croton water, New York, coll. by R. Hitchcock. *St. Pseudosebaldi*, Nord., in Budd's Lake, N. J.

STAURASTRUM DIVARICATUM, *n. sp.* (Plate XIII, Fig. 12.) St. parvum, paullo longius quam latius, granulato-asperum; sinu lineari angustissimo; semicellulis subquadratis, angulis superioribus in cornu elongatum divaricatum, apice bifido, productis; a vertice visum forma pentagonali, quinque-radiatum. Diam., sine cornibus, .0015″.

Hab. In a pond, Hammonton, N. J. Coll. by Rev. H. D. Kitchel.

This species approaches my *St. pusillum*, but is somewhat larger and has not 4 but 5 arms, which are not obtuse but bifid.

STAURASTRUM CORONATUM, *n. sp.* (Plate XIII, Fig. 16.) St. submagnum, dupla parte circa latius quam longius; sinu angusto-lineari; semicellulis fere obovatis, lateribus in cornu incurvum productis, sursum sensim dilatatis, in apice convexo processibus dentiformibus in coronam ordinatis; semicellulis a vertice visis 6-radiatis, in medio coronula papillarum ornatis; radiis apice subtiliter trifidis, marginibus delicate serrato-dentatis. Long. .0018″; lat. .0033″; isth. .001″.

Hab. Denmark Pond, New Jersey.

This plant has the crown-teeth of *St. rotula*, Nord., but not the size, number of arms, nor the serration.

STAURASTRUM DISTENTUM. *n. sp.* (Plate XIII, Figs. 7 and 7′.) St. mediocre, leve; semicellulis fere obovatis, sursum sensim dilatatis, apice convexo-crenulatis; angulis superioribus in radium elongatum gracilem substrictum productis; margine non denticulato, apice profunde trifido distento. Semicellulis a vertice visis 5-vel rarius 6-radiatis, apice radiorum tridentato, dilatato, inter bases hastatas sinu profunde lineari. Diam. et long., cum rad., .0016″.

Hab. Ponds, Sussex Co., N. J.

The sinus between the hastate bases of the radii, reminds one of my *St. pulchrum* (TORREY BULL., April, 1880,) but the sinuses are linear, not circular, and the ends of the radii are not obtuse but trifid, with the three teeth unusually large and spreading.

STAURASTRUM FUSIFORME, *n. sp.* (Plate XIII, Fig. 8.) St. submagnum, semicellulis angusto-fusiformibus, angulis lateris in processus longissimos achroos margine crenato-dentato apice bifurcato productis; dorsum subacutangulare, crenatum; semicellulis a vertice fusiformibus, lateribus in radios rectos, gracillimos attenuatis, apice bifido. Diam., cum rad., .005″–.0055″; long. .0015″.

This species appears to be related to *St. leptocladum*, Nord., and *St. grallatorium*, Nord., but differs from both in form of cell; from the former in the length of body, and from the other in the absence of the produced back and the aculei.

STAURASTRUM KITCHELII, *n. sp.* (Plate XIII, Figs. 2 and 2′.) St. parvum, circiter tam longum quam latum, leve; semicellulis ellipticis divergentibus, introrsum ventricosis, dorso plus minus inflato, angulis in processus bifurcos productis, a vertice triangularibus, medio processibus similibus tribus radiatis ordinatis. Diam. .0015″–.200″.

Coll. by Rev. H. D. Kitchel in Gilder Pond, Mt. Marcy, Vt.

Ralf's *St. spinosum* bears a similarity, but is separated by having two or more spines on each side beside the one terminating each angle. *St. furcatum*, Ehrb., is also akin, but has more spines. These forms are moreover, granularly roughened, not smooth. The spines are not properly "lateral" but central, the ends projecting over the sides.

Staurastrum proboscidium, Bréb., var. AMERICANUM, *n. var.* (Plate XIII, Fig. 10.) This plant was collected in Crystal Bay, St. Lawrence River, Canada, by J. M. Adams. It bears some similarity to a variety of *St. asperum*, described by Brébisson, and also to a form, *Javanica*, described by Nordstedt; but it differs in the arrangement of the granules and in the shape of the rays (proboscidii), which are longer and more cylindrical.

STAURASTRUM TRIDENTIFERUM, *n. sp.* (Plate XIII, Fig. 13.) St. exiguum leve, sinu amplissimo; semicellulis ellipticis, dorso convexo, vel subplano, angulis in aculeos tres rectos divaricatos productis, a vertice visis triangularibus, lateribus modice retusis, tribus aculeis in angulos impositis. Diam. sine aculeis .0008″; cum ac., .001″. Hab. in a pond near Bethlehem, Pa.

This plant is nearest a form of *St. dejectum*, but is separated by the three spines at the angles.

XANTHIDIUM, Ehrb.—XANTHIDIUM TETRACENTROTUM, *n. sp.* (Plate XIII, Figs. 14 and 14′, front and end view. X. parvum, circiter tam latum quam longum, leve, constrictione acute cuneata (non lineari); semicellulis subreniformibus vel subhexagonalibus, basi subplana, dorso late rotundo-truncato, uno angulo mediano utrinque in aculeos geminatos breves acutos producto; tuberculo centrali minus elevato; cytiodermate levi vel serie singula parvularum granularum praedito. Diam., sine sp. .0013″–.0015″; cum sp., .0024″–.0025″; long. .0015″–.0016″.

Hab. Ponds, Sussex Co., New Jersey.

The shape of the semicells is very near that of *X. fasciculatum*, but they are much smaller and bear only two pairs of aculei, not four or six.

BATRACHOSPERMUM, Roth.—*B. vagum*, Roth., var. RAVENELII, *n. var.* B. bi-tri-polices longum, crassum flavo-aerugineum, sine corticulo, vel rarius ramulis accessoriis; articulis diametro (ad.006″.) plerumque aequalibus vel paulo plus minus, achrois; ramis primariis parcis; ramulis verticilli plerumque brevibus; verticillis confertissimis, nonnumquam nullis, sed saepius quoque geniculo cum 2–3 fasciculis brevissimis instructo.

Collected by H. W. Ravenel, at St. John's, Berkley, S. C.

This is a distinct form, particularly in the absence of the accessory filaments which constitute the corticular covering or rind of the primary filaments. Bory is credited with a variety of like character, but of dark purple color, verticils far apart and branchlets long; mine on the contrary is of yellowish green or light aeruginous color, verticils very close and branchlets very short. The articulations or cells of the stems are short, colorless, often much contracted at the joints; this feature causes some parts of the filaments to have a striking resemblance to forms of *Draparnaldia.*

The Fruits of Cucurbita.

By C. C. Parry.

(Plate xiv.)

It naturally happens that the fruits, even of common plants, especially those of a fleshy or bulky character, are poorly represented in herbaria. In consequence of this fact, the descriptions in systematic works are often defective in this important particular. I propose, as a small contribution towards supplying such defects, to present some outline sketches, and diagnostic characters of three species of *Cucurbita* that have lately come under my notice.

In all the generic descriptions of *Cucurbita* the fruit is represented as three-celled, *i. e.*, with three placentas.

It is now over thirty years since my attention was cursorily called to the fact that a species of *Cucurbita*, not uncommon in the vicinity of San Diego, California, was quite constantly 5-celled. From want of sufficient material this species remained unnoticed, till lately described by Mr. Watson as *Cucurbita palmata*, but without his noticing its 5-celled fruit.

Another still older species, of Arizona, *Cucurbita digitata*, Gray, is also found to possess the same character, having 5 placentas. It is perhaps something more than a coincidence, that both these species, as well as the doubtful *Cucurbita Californica*, Watson, have five-lobed leaves, as distinguished from *Cucurbita perennis*, Gray, in which the leaves are triangular, and the fruit normally 3-celled. The accompanying sketches (all natural size) will help to exhibit these characters, and also show the usual variation in size of fruit and seed.

Referring to each in regular order we note the following diagnostic characters:

Cucurbita perennis, Gray.—Fruit orbicular, medium size, 2–2½ inches in diameter, normally 3-celled (occasionally, in large specimens, 4-celled); outside marking lemon-yellow on a greenish ground, longitudinal lines irregular, *i. e.*, not corresponding to internal divisions; placentas thin, separating at maturity; seed unevenly curved, its length 4-5 lines, about twice its breadth, with raised margins.

Cucurbita digitata, Gray.—Fruit rather flattened, orbicular, 2-3 inches in diameter, normally 5-celled, (rarely 6); outside marking brownish yellow, the longitudinal lines very distinct, corresponding closely to the 10 internal divisions, the lines corresponding to the thickened placentas being the broadest; seeds evenly ovate, light brown, 4-5 lines long, less than one-half the breadth, thick, without raised margins.

Cucurbita palmata, Watson.—Fruit orbicular, 3-5 inches in diameter, 5-celled (rarely 6); outside markings more blotched, green and light yellow, longitudinal markings moderately prominent and usually corresponding to internal divisions; placentas thickened; seeds plump, whitish, broad-ovate, somewhat irregular, 5-6 inches long.

DESCRIPTION OF PLATE XIV.—Fig. 1., *Cucurbita perennis*, Gray. *a*, cross-section of mature fruit; *b*, a seed. Fig. 2., *C. digitata*, Gray. *a*, cross-section of mature fruit; *b*, a seed. Fig. 3., base of fruit of *C. digitata*, showing 10 longitudinal markings. Fig. 4., *C. palmata*, Watson, *a*, cross section of fruit; *b*, a seed.

New Californian Plants.

By MARCUS E. JONES.

✓ TRIFOLIUM MULTICAULE.—Stems many from the summit of a thick, upright, perennial root, diffusely spreading, very slender, 6′–12′ long; leaflets three, 3″–4″ long, 1″–1½″ wide; lowest obovate, cuneate, notched; upper ones oblanceolate, obtuse, (central one cuneate), finely serrate; stipules ovate, toothed; peduncles axillary, 1′ long, twice as long as the leaves; involucre ½″–1″ long, 3-5-cleft, divisions entire or 2-cleft; flowers 5″ long, narrow, not inflated, not recurved, very shortly pediceled; calyx sparsely hairy, 10-nerved, teeth subulate or long-triangular, one-nerved, scarcely aristate, edge smooth; corolla yellowish-white with a purple keel; pod 2-seeded; lower petioles short; pubescence villous, spreading.

Soda Springs, near Summit, Cal., July, 1882.

This is apparently very distinct from any other *Trifolium*, and is one of the prettiest species.

Mr. Watson informs me that this plant is *T. monanthum*, the pubescent form. It is, however, a mistake I think, to refer a thick-rooted perennial to a slender annual. It is undoubtedly distinct, even if *T. monanthum* is a perennial (contrary to all our previous knowledge of it) for the true *T. monanthum*, if other specimens so referred by Mr. Watson are correct (and there is no doubt of his accuracy in the matter) is a very delicate, prostrate, glabrous plant, with slender, creeping, perennial rootstocks, while *T. multicaule* has a thick, vertical root, which produces many ascending stems; the plant is softly hairy, and the flowers have a more conspicuous involucre and are more numerous.

✓ GRINDELIA PACIFICA.—Stems clustered, 6′ high, erect or ascending, branching toward the top; root-leaves filiform, 2′–4′ long, varying to very narrowly oblanceolate with a long filiform petiole, entire or with a tooth or two at the summit; upper stem-leaves oblong-lanceolate; short, sessile, with a broad, cordate, clasping base, entire or sparsely toothed; uppermost leaves passing into the involucral scales, which are lax and with filiform herbaceous tips 3″–12″ long; involucre not over 6″ broad; rays yellow, 3″ long; heads terminal.

On the hills at Santa Cruz, Cal.

Very peculiar in the filiform root-leaves.

✓ *Spraguea umbellata*, Torr., var. MONTANA.—Petals white, stamens yellow; scarious bracts 2″-4″ long, very broad, equalling the sepals and very conspicuous.

Soda Springs, near Summit, Cal., July, 1882.

This plant appears to be very distinct, but, after a careful comparison of several hundred specimens in various stages of development, I find it shows a transition or similiarity in other respects, though not in the characters given above. The bracts of *S. umbellata* are from 1″ to 1½″ long, usually ½ smaller than the sepals, the upper scales on the stem are slightly hyaline at base; seed black, shining and *tuberculate* in pretty evident circular lines, not striate as figured by Torrey. The bracts of var. *montana* are scarcely ever shorter than the sepals, but often longer; upper scales on the stem hyaline all over, the hyaline part on each side being twice the width of the green centre. The heads of *S. umbellata* are usually divided into many small, dense, round glomerules: in the var. they are all compacted into one large dense head, the peduncles seldom being longer than the bracts. The bracts of *S. umbellata* are obvate; those of the var. are ovate-oblong or (usually) orbicular. The var. grows at a higher altitude than the typical form, generally close to snow.

OXYTHECA REDDINGIANA.—Bracts united only at the base, linear, hirsute, awnless, gradually reduced; leaves very narrowly linear-oblanceolate, 1″ long, less than 1″ wide, hirsute; involucres 4-cleft below the middle, the short, ovate hyaline margined lobes barely acute, ½″ long, awnless; pedicel glabrous, reddish, capillary, from 2 to 10 times the length of the involucre: flowers 1″ long, deep rose-colored, the centre of the segments almost black and the edges white or yellow, segments ovate, rounded, somewhat narrowed at base, sparsely hairy along the centre. The main stem and all its branches are pubescent with stalked glands. Resembles *Gilia pusilla*, and is scarcely less delicate.

Near the snow-sheds at Soda Springs, near Summit, Cal., July, 1882. Dedicated to Mr. B. B. Redding, to whom we are indebted for much of our knowledge of Californian botany. Though his interest has been greater and his aid more substantial than that of almost any other man, his services have never yet been recognized. I therefore take this opportunity to dedicate to him this pretty little annual.

Mr. Watson says that this plant is *Eriogonum spergulinum*, but it is in my judgment a far better *Oxytheca*, and is wrongly referred to *Eriogonum*. Its nearest relatives are *O. inermis* and *O. dendroidea*. It tends to invalidate the genus *Oxytheca*, as does also *O. inermis* by the absence of awns. It is, however, in all other respects a good *Oxytheca*.

Salt Lake City, Utah.

Change of Name in a Grass.—In recent studies on *Hilaria* and *Pleuraphis* I came to regard them as very closely allied genera, and, in fact, saw no reason why they should not be united. The characters of the spikelets also pointed rather to Paniceae (being articulated with the pedicel below the glumes, etc.) than to the tribes into which they had been assigned by authors—*Hilaria* in Phalarideae and *Pleuraphis* in Pappophoreae.

I communicated these views to my friend Dr. Vasey, Botanist of the Department of Agriculture, at Washington, and he states in reply: "As to *Pleuraphis*, you are correct as to its relationship with *Hilaria*. Mr. Bentham, in his recent paper on Gramineae, reduces *Pleuraphis* to *Hilaria*, so we must now write *Hilaria Jamesii*, Benth., etc. So, likewise, you are correct in placing *Hilaria* in Paniceae—tribe Zoysieae, according to Bentham."

There are three described species of *Pleuraphis* from the Southwest:

1. *P. Jamesii*, Torr., in Ann. Lyc., N. Y., i, 1824, p. 148 t. 10. M. E. Jones has distributed this in his Colorado collections.

2. *P. mutica*, Buckley in Proc. Acad., Phil., 1862, p. 95. There are specimens of this in the Herb. Acad. Phila., and I have specimens collected by Frank Tweedy in Tom Green County, Texas, 1880. Nos. 760 and 2108 of C. Wright are the same (Gray in Proc. Acad. Phil., 1862, p. 335.)

3. *P. rigida*, Thurber, Gram. Mex. Bound, ined., published in Bot. Cal. ii, p. 293. It is No. 494 of E. Palmer's collection, 1877.

These three species are now placed in the genus *Hilaria*, and if due credit is to be given their authors they should be written *Hilaria Jamesii*, (Torr.) Benth., *H. mutica*, (Buckley) Benth., and *H. rigida* (Thurb.) Benth.

Hilaria cenchroides, H.B.K. The single species heretofore inincluded in this genus was distributed with E. Hall's Texan plants, No. 846, and it is in Pringle's sets of Pacific Slope Plants, collected in Arizona, near Camp Lowell, July, 1881.

F. LAMSON SCRIBNER.

Theory of Lichens.—Dr. J. Müller of Geneva, Switzerland, has recently pointed out an interesting confirmation of Dr. Minks's theory of lichens in a Brazilian *Coenogonium*. In this genus, one or more species of which occurs in the Southern States, the gonidial system is composed of a series of green cells contained in a longitudinal central tube, and surrounded by slender colorless filaments; the former corresponding, in the Schwendener theory, to the algoid element, and the latter to the fungoid. In the new species, *C. pannosum*, Müll., Arg. in *Flora*, 1881, p. 234, a filament of the latter kind was found in a portion of its length to contain gonidia resembling those of the algoid tube, but at a certain point it suddenly contracted to the form of a cone a little longer than broad, and continued as a slender capillary tube, in which the internal cavity was continuous with that of the larger portion; and in this portion of it were clearly perceived the microgonidia in their natural form, size and arrangement.

It follows from this, says Dr. Müller, that one and the same cell, at one end enlarged and bearing gonidia, would be the theoretic alga, and at the other contracted and containing microgonidia would be the theoretic fungus, proving absolutely the falsehood of the theory, all is lichen, and only lichen, and both sorts of tubes, so different at first sight, are only different states of evolution of one and the same organ.

New Bedford, Mass. H. W.

New Station for Arceuthobium.—Central New York has, in days gone by, been the home of many prominent botanists, and a new discovery in this section is of rare occurrence. I have the pleasure of announcing a discovery of my own. On May 28th and June 25th, 1881, I detected *Arceuthobium pusillum*, Peck, growing very abundantly on *Abies nigra* in the Graefenberg swamps on the heights of Frankfort, Herkimer County, N. Y., about six miles S. E. of Utica. My surprise was great, inasmuch as the same region had been most thoroughly explored years ago, as shown by the record in Paine's Catalogue. Prof. Asa Gray, Drs. Vasey and Knieskern, John A. Paine, Jr., Edwin Hunt and others were all probably well acquainted with the locality, and it is truly remarkable that the plant should have been overlooked by them, since its great abundance now, indicates that it has had its home there for years. Suspicion alone on my part led to its discovery. I had received specimens from Oswego County from my friend Rev. J. H. Wibbe, and, when his locality was made known to me, I suspected that the plant might grow nearer home. In 1879 I looked for it in N. Herkimer and Hamilton Counties but failed to find it; but last year I made a special effort and succeeded. It was an easy discovery, however, as almost the first spruce that I examined was literally covered with it. The pistillate plants were the most abundant, and some of them measured nearly an inch in length. The plants were not confined to stunted trees, but were found sparingly on the lower branches of healthy ones. I noticed that all growths of from five to fifteen feet high were favored, especially where the tops had been broken off; and new shoots in a circle at the tops were completely covered. I thought at the time that *Abies alba* and *A. balsamea* might be affected in the same way, but was prevented by ill health from making the investigation, and was unable for the same reason to discover any other station. As, in this immediate vicinity, there are other localities almost identical, I think that another season will show the plant to be more widely distributed, and to grow in Oneida County as well.

Utica, N. Y. JOSEPH V. HABERER.

Note on Oregon Grasses.—The two grasses here named were collected by Mr. C. G. Pringle at Roseburg, Oregon, Oct. 2d, 1881.

Gastridium australe, P. B. (Thurber in Bot. Cal. ii, page 275).—Dr. Thurber states, upon the authority of Mr. Bolander, that this grass is common in California on the coast, and "late in the season covers the dry hills everywhere." I am not aware of any record having been made of its occurrence in Oregon.

Aristida oligantha, Mx. (Gray., Man. 5th ed., p. 618).—The awns are a little shorter than in specimens from the Eastern States, and both the glumes and florets are deeply colored with purple. This grass has not before been reported west of Colorado.

F. LAMSON SCRIBNER.

Design of some Leaf-forms.—Most aquatic plants are so formed that they offer but little resistance to moving waters. Many species of *Potamogeton*, *Isoetes*, *Chara*, *Nitella*, and algae have filiform leaves or stems (or both), which offer but little resistance to changing currents of water. *Ranunculus aquatilis* and *Potamogeton* (a dozen species) have filiform leaves below the surface of the water, and spreading leaves above. The floating heart, frog's-bit, duck-weed, pond-lily, *Marsilia*, etc., with their hanging roots, or slender stems, present no opposing surface to water. *Polygonum aquaticum*, with its float-like leaves at the ends of long and slender petioles, is not likely to be torn from its place of growth, however swift the current.

The form and arrangement of the leaves of conifers and heaths are well adapted to wind-swept regions. The conifers grow in the highest Alpine regions the world over, where they are subjected to the most violent winds and storms; but their leaves, being so very small and unusually well secured to the branches, offer but little resistance to the winds. The winds that set the oaks, elms and maples in an uproar pass over the pine, larch, and spruce with a whisper. On the wind-swept moors and downs of England the fine-leaved heaths grow in the greatest profusion.

Possibly it might be worth while for some botanists to consider why each family or species of plants has leaves of a shape peculiar to itself, and why some other form would not do as well, keeping in view the plant's place of growth and the work it has to do. The function of leaves as depositories of food and moisture, and that of bulb-scales, bud-scales, spines, tendrils, pitchers, fly-traps, etc., has been well explained, but are there not some other interesting generalizations that are known to some botanists and which have not been made known to botanists at large?

The thick and glossy leaves of the Ericaceae, the much-divided leaves of the Umbelliferae, the thick and succulent leaves of many salt-marsh plants, and other well-known facts, suggest questions which are not easily answered in a satisfactory manner by one man; but, by the mouths of many witnesses, the design of some leaf-forms may be established.

Do the rings of beets show growth during any definite period of time?

Roxbury. Mass. H. L. Clapp.

Gleanings in Westchester County.—In October, 1880, I stumbled upon a small cluster of *Aster amethystinus*, Nutt., about half a mile North of Wood-Lawn Cemetery, on a new road leading to Mount Vernon. Several species of *Aster* were growing near by, but I failed to find this one in any other place, though I searched for it through fields and along road-sides for a mile or more around.

In July, 1881, I found *Scirpus sylvaticus*, L., and *Melanthium Virginicum*, L., in a small bog about a mile East of Tarrytown. In neglected yards and gardens within the village proper, *Galinsoga parviflora*, Cav., has appeared in profusion, but as a recent interloper.

Yonkers, N. Y. E. C. Howe,

A Query.—Can any reader of the Bulletin forward proof that *Carex Knieskernii*, Dew., is a good species? Dr. Gray, in comparing it with *C. Sullivantii*, says: "Perigynia glabrous and more evidently nerved." Dewey (in Wood) refers to an "oblong achenium." Now, *C. Sullivantii* has an oblong achenium, but it is always abortive. Dr.

Geo. Vasey regards this so-called species as a form of *C. sylvatica*, Huds., (of Europe); but the latter is more than thrice as small, and the perigynia are long-beaked. Mr. William Boott writes me that *C. Sullivantii* and *C. Knieskernii* are one and the same. Is it possible to get any further light on this subject?

Yonkers, N. Y. E. C. Howe.

The Syracuse Botanical Club.—Since commencing our expeditions this season we have made many new additions to our collection of the Onondaga flora, among them being *Magnolia glauca*, L.; *Stellaria longifolia*, Muhl.; *Geranium maculatum*, L., with pure white flowers; *Rhamnus catharticus*, L.; all of the maples given in Gray's Manual; *Gymnocladus Canadensis*, Lam.; *Potentilla palustris*, Scop.; *Pyrus sambucifolia*, Cham. & Schlecht.; *Amelanchier Canadensis*, var. *Botryapium*, T. & G., a tree fully fifty feet high; *Chrysosplenium Americanum*, Schwein.; *Oenothera pumila*, L.; *Lonicera oblongifolia*, Muhl., with pure white flowers; *Viburnum nudum*, L.; *Hieracium aurantiacum*, L., although an introduced plant, becoming very common, even springing up in the flower-beds in our gardens, and another introduced composite, *Tragopogon pratensis*, L., bidding fair to be as common along roadsides and in fields; *Specularia perfoliata*, A. DC.; *Kalmia glauca*, Ait., for the first time in flower; *Ilex monticola*, Gray; *Plantago lanceolata*, L., with hypertrophied compound spikes; *Menyanthes trifoliata*, L.; *Myrica Gale*, L.; *Betula pumila*, L.; many willows of whose species we are not as sure as we hope to be; *Zannichellia palustris*, L.; *Potamogeton crispus*, L., in fruit in Seneca River; *Scheuchzeria palustris*, L., in flower; *Habenaria virescens*, Spreng., sweet-scented, with the odor of clover; *Smilacina trifolia*, Desf.; *Ornithogalum umbellatum*, L., in bloom in the midst of Cicero Swamp; *Eriophorum vaginatum*, L., and *E. gracile*, Koch., vars. *paucinervium* and *brevifolium*; *Carex siccata*, Dew.; *C. Muhlenbergii*, Schk.; *C. stricta*, Lam.; *C. crinita*, var. *morbida*, Carey; *C. limosa*, L.; *C. irrigua*, Smith; *C. grisea*, Wahl.; *C. debilis*, Michx.; *C. riparia*, Curtis; *C. Pseudo-Cyperus*, L., and *C. lupuliformis*, Sartwell. We have just begun collecting *Gramineae* and *Equisetaceae*. One of our members, Mrs. Leach, has at last discovered two stations for *Ophioglossum vulgatum*, which had been found before in Onondaga County, but not by any of the Syracuse Botanical Club. Most of our old floral friends we have found ready to greet us whenever we have visited their homes.

Mary Olivia Rust.

Correction.—In Mr. Greene's article in our February number, the word "leaves" (p. 16, 9th line from bottom) should read "rays."

In Mr. Ravenel's note on page 23, "just in leaf" (line 17) should read "not in leaf," and "eight feet" (line 20) should read "three feet."

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Development of the Cortex in Chara.

Illustrated by a Series of American Species.

By T. F. ALLEN.

(Plates XV–XXII.)

A classification of the species of *Chara* based upon a correct and thorough knowledge of their morphological characteristics was first attempted by the late Prof. A. Braun, who so arranged the genera and species of the whole order Characeae, that we are able to trace a gradual development from the simplest dioecious *Nitella*, with unicellular stems and leaves, to the most completely developed *Chara* (*C. fragilis*, Desv.). The formation of "nodes" and a complete development of the node-bract and fruit-bearing leaf may be already seen in the simplest *Chara*; but the genus is still further elevated by the growth of a cortical series of cells, which may be traced from the rudimentary cells of the leaf-node to a perfect evolution.

The development of "stipules" (traces of which begin to appear in the most highly organized *Nitella*) has been used by Prof. Braun to mark the three general divisions of the genus *Chara*, and the character of the cortication serves to mark sub-divisions. Both stipular and cortical cells spring from the nodal cells, and a consideration of their character must be preceded by an inquiry into the nature of a node.

The stem of a characeous plant grows through the formation of cells, by a process of sub-division of the apical growing cell. In Plate XV, Fig. 1*a*, *a* represents the growing apical cell; *n*, a cell which has itself sub-divided and is destined to be the node; and *i*, an inter-nodal cell which does does not sub-divide, but which is destined to elongate indefinitely. The next figure (Fig. 1*b*) illustrates a developed stem, in which the inter-nodal cells *i*, *i* have extended, while the nodal cell *n* has sub-divided, but has not elongated.

From these nodal cells develop, in various ways, all organs—leaf, bract and new shoots; antheridia and sporangia; stipules and cortex.

Since, in this paper, we have to deal with the development of the cortex of the stem only, we may consider first a node of the stem with a basilar node of a leaf.

"A primary nodal-cell of the stem divides, soon after its origin, into two secondary cells by means of a vertical septum through its diameter; in each of these half-cells a semi-circle of peripheral cells forms by a farther eccentric, vertical fissation in such manner that a new fissation occurs alternately on one or the other side of the semicircle. Both semi-circles begin on the same side of the node, progress toward each other, and, when at last they close together, form a complete circle of cells enclosing the two central cells, which, as remnants of the original halving-cell, form the nodal cells in the strictest sense. The peripheral cells are the mother-cells of just so many leaves. The number of these cells, and of leaves in a verticil, amounts in most *Nitellae* regularly to six (very seldom five) and in *Chara* mostly to eight or ten, or even to fourteen or more. The leaves of successive verticils alternate with each other; for the halving-septum of each succeeding node forms an angle with that of the preceding, equal to a half interval of a verticil, so the position of the first leaf of each successive vertical deviates a half interval from that of the first leaf of the preceding verticil. In this way a definite precession is established; the first leaves of the verticils forming a spiral with small divergence ($\frac{1}{12}$, $\frac{1}{14}$, $\frac{1}{16}$, etc.). This spiral is always to the left (downward, T. F. A.); and in this direction, with the increasing tension of the internodes, a more or less noticeable torsion of the stem takes place, most distinctly seen in corticated species; in the naked species marked by the oblique course of the chlorophyll granules and indifferentiated striae (indifferenz-streifen) as well as by the direction of the circulation." (A. Braun.)

Fig. 1*c*, of the same plate, represents a stem-node of *Chara coronata*, as seen from above, without the leaves. Each of the peripheral cells develops a leaf, as follows: the cell divides into two unequal portions by a horizontal septum, the lower and smaller segment remains in the node, while the upper divides into a "globular complexity" of cells, protrudes from the node and forms the basilar node of the leaf. This node consists of central and peripheral cells. The peripheral cells divide parallel to the surface of the node-disk, giving rise to superposed marginal cells; *the lower marginal cells give rise to the cortex-cells of the stem*; and the upper develop usually somewhat on either side of the lower and give origin to the stipules. Usually there are two stipules at the base of each leaf, one on either side, but in *Ch. ceratophylla* there is a third stipule developed from a cell arising between the other two. In *Ch. coronata* one of the lateral stipular cells fails to develop and but one stipule is seen, so that the stipules seem to alternate with the leaves. In *Lychnothamnus Wallrothii* the stipular cell remains directly in the centre, and the stipule is exactly opposite the leaf, no cortex being developed. *Chara stelligera*, possessing neither stipules nor cortex, exhibits at the base of the leaf three insignificant cells, protruding slightly. In *Nitella* and *Tolypella* we find no trace of cortical or stipular cells, though now and then accessory, simple, leaf-like formations remind one of stipules. In *N. hyalina* these are numerous, arising from the base of the leaves in pairs, externally or even internally.

The cortex-cells, arising from the basilar node of the leaf, behave in a manner quite similar to the primary cells of the stem. They consist of alternate, elongated and nodal cells; the former elongating as the stem elongates, the latter not elongating, but forming a node which develops a wart or spine and lateral cells.

1.—Some species of *Chara* never develop these cortex-tubes, and the stems remain naked, like those of *Chara coronata*, Ziz.

2.—Some species develop a simple cortex-tube, which is so small that it does not join the one from the next leaf, as *Chara inconnexa*, Allen.

3.—Some cortex-nodes develop spines but no secondary tubes; the primary tubes join and completely encircle the stem; *e. g.*, *Ch. crinita.*

4.—Some cortex-tubes show a partial development of secondary tubes, as in *Chara evoluta*, Allen.

5.—Some cortex-tubes develop *one* secondary cell only, which becomes as long as the primary cell, but smaller in size, as in *Chara excelsa*, Allen (also *Chara intermedia*, A. Br., *Ch. contraria*, A. Br.). (Section Tylacanthae.)

6.—Some develop only one lateral cortex-cell, which becomes larger than the primary cell and partially covers it, so that the primary cell seems to lie in a valley (Section Aulacanthae); for example, *Ch. foetida*, A. Br.

7.—Some cortex-cells develop perfectly one lateral cell and imperfectly another, as, for example, *Ch. aspera.*

8.—Some cortex-cells develop perfectly both lateral cells, so that three complete series of cells arise from each leaf, as in *Ch. fragilis* (also in *Ch. gymnopus*, A. Br.).

In Plate XV the figures correspond to the divisions given above. In *Chara aspera* the greatest variability may be observed (Fig. 7 from true *aspera*, Canada, and 7*a* from var. *Macounii*). In Fig. 7 the secondary cells meet obliquely, while in 7*a* one of the secondary cells extends past the other, so that a section of the stem at this point would show more than double the number of cortical tubes as compared with the leaves of the verticil. Fig. 7*b* was taken from a form of *Ch. aspera*(?) from Fort Pond, Long Island; unlike those of the typical *Ch. aspera*, the secondary cells join with square and not obliqe ends, and these cells never or rarely overlap, as in true *aspera*; but the irregularity of the cortex is produced by the partial and irregular development of secondary cells from the opposite side of the node of the primary cell.

I have been unable to find subterranean bulblets on this plant, and a thorough examination may show affinities rather with *Ch. Krausii* (whose secondary cortex-cells join rectangularly) than with *Ch. aspera.* In Fig. 8 is represented a typical triplostichous cortex in which cells develop from both sides of the node to the primary cell and extend upward and downward to join cells from neighboring nodes. In Fig. 8*a* is represented an anomaly, sometimes noticed, in which, by reason of an unusual extension of some cells, the cortex becomes hyper-triplostichous. In Fig. 8*a*, *x*, *x* represent the primary tubes; *d*, a normal secondary tube which meets *d'* below and extends above to *c*, the latter overlapping and extending down to meet *a*, which in turn has overlapped *b* and extended up to meet *c*. At *b*—*d* there are *three* series of tubes between the primary series. Both *Chara fragilis* and *Ch. gymnopus* are, as a rule, regularly triplostichous; the former as regards the stem only, the latter both in stem and leaf.

Chara coronata, Ziz.—A description of the various forms of this species has been given recently in the *American Naturalist*, and it is unnecessary to reproduce it here. The cortex-cells of the basilar node of the leaf are rudimentary and the stems are entirely devoid of any cortex development. Plate XVI, illustrating one of the American varieties of this species, has been used in the *American Naturalist*.

CHARA INCONNEXA, *n. sp.*–Humilis, 3–4 cm. in alt. Caulis inermis, inferne ecorticatus, superne imperfecte corticatus cellularum seriebus cum numero foliorum congruentibus disjuncts. Folia verticilli 7—8, uno vel duobus ex articulis, foliola et fructiificationem gerentibus, partim ecorticatis, partim haplostiche disjunctis corticatis, partim diplostiche corticatis; segmentis ultimis elongatis, 1—2-articulatis, cellula terminali mucronem formante; corona stipularis e duplici cellularum serie, minima, inconspicua. Foliola plerumque unilateralia, posteriora saepe evoluta, anteriora sporangio breviora, non inflata. Sprorangium 8—10-striatum, 1 mm. long., coronula brevi truncata; nucleo 600μ longo.

This exceedingly interesting plant was collected in Iowa by Prof. C. E. Bessey. The lower portion of the stem is quite naked, and translucent like *Nitella*; the lower verticils consist of long Nitella-like leaves which bear no nodes or bracts and have generally two articulations, the termmal segment forming a short mucronate tip. These leaves seem to me to have no stipules, though I have not been able to examine fresh specimens. The lowest fertile leaves are always entirely naked, and in these verticils are found a few rudimentary leaves without nodes or bracts. In the upper part of the stem the internodes of the latter become corticated in the primitive manner described and illustrated in the figure. The character of the cortication seems to be quite like that of *Ch. imperfecta*, A. Br. *Ch. dissoluta* A. Br., differs in a partial development of the lateral cells of the node of the cortex, so that the space between the primary cells of the cortex is filled at *intervals*, though spaces are left between the nodes. *Ch. imperfecta* is, however, dioecious, and has quite long bracts. *Ch. dissoluta*, to which this plant seems most nearly allied, differs in the more numerous nodes of the leaves, the larger and more striated nucleus, etc.

The upper leaves of this plant vary greatly in the same verticils; two nodes are commonly found with bracts and fruit, the lowest internode having a perfect double cortex, the upper an imperfect, disconnected cortex, like the stem, the leaf above being entirely ecorticated and quite long. Some leaves have two fertile nodes, with only the lowest internode corticated in the disconnected, imperfect manner characteristic of this plant; while other leaves (generally but one or two in a verticil) one entirely barren of fruit, bract, or node, and have one or two simple articulations merely. Frequently, in the upper part of the stem, the posterior bracts are quite plainly developed, but much smaller than the anterior.

The plant is small and very dark green; the stems are clothed with the long straight leaves and are rigid with incrustation.

Chara crinita, Wallr. (Ann. Bot., 1815); *Ch. horridula*, Dethardting, in herb., 1809; *Ch. canescens*, Lois., Notice, 1810 ("Description imperfect," A. Braun); *Ch. muricata*, Hartmann, Skan. Flora, 1843; *Ch. condensata* et vars. *subflexilis* et *erythrella*, Wallm., 1854; *Ch. Karelini*, Lessing, Novit. Fl. Ross. in Linn., 1834; *Ch. erythraea*, Hering, in herb. Schimper; *Ch. dioica* et *Ch. sphagnoides*, Griffith, posth. papers.

Stem low, mostly simple or sparingly branched; cortical cells large, equalling the number of the leaves, completely encircling the stem ; the nodes of the cortex numerous, armed with spines usually three from each node, of about equal length, as long as the diameter of the stem ; the spines so numerous that the stem is completely hidden by them. *Stipules* double, directed upward and downward, two at the base of each leaf, the upper longer than the lower, as large as the spines, about as long as the first internode of the leaves. *Leaves* 8—10, usually 9, in a verticil, short, somewhat incurved ; internodes 4—7, usually 5, corticated like the stem, haplostichous, except the terminal segment, which is naked and simple, rarely articulated, and with the whorl of bracts of the last node, which are nearly as long, forming a terminal tuft. *Bracts* verticillate, equally developed all around the node, usually much longer than the sporangium, except three very short extra bracts subtending the sporangium, which seem to stand in the place of the antheridium, sometimes the middle one of these three "bracteoles" is elongated to nearly the length of the sporangium. *Sporangia* oblong-oval with 15–16 whorls on one side, coronula somewhat connivent (in American forms) rather short. Nucleus black, with 12 to 15 sharp angles on one side; in one form (*pachysperma*) broadly oval, in another (*leptosperma*) narrowly oblong. Antheridia very rarely seen ; the plant propagating itself by parthenogenesis. Dioecious.

I have considered the American plant a distinct variety, on account of its large seeds (nuclei 620 μ long ; in the European forms from 350 to 560 μ long) ; indeed, it seems to occupy a position nearer the following species (*Ch. evoluta*) than the European forms do.

The larger form (*pachysperma*) was gathered in 1860 by the writer on the shore of Great Pond, Montauk Point, Long Island. The pond at that time was fresh, or slightly brackish from the occasional breaking of salt water over the bar which separated it from the sea. Since then an inlet has opened and the pond has become nearly as salt as the sea, and though searched for repeatedly the plant has not been found there since. *Ch. aspera*, then found in company with *Ch. crinita* (as it frequently is), has disappeared also from that pond, though it may still be found in Fort Pond, a few miles distant, associated with *Ch. delicatula*, Ag. Forma *leptosperma* has been found at Polpis, Nantucket, by Mrs. Maria L. Owen. In the brackish lakes of Western Canada Prof. Macoun gathered, along with *Ch. evoluta*, some plants which approach very closely to *Ch. crinita*. They seem to be dioecious (no antheridia could be discovered), and to lack the small bracteoles in front of the sporangia, and they have large nuclei.

Prof. Nordstedt writes that *Ch. crinita* exhibits, in rare specimens, some tendency to the development of secondary cortex-tubes.

CHARA EVOLUTA, Allen (*in lit. ad* Prof. Nordstedt, 1881).—*Euchara*, *diplostephana*, *haplosticha* (vel *sub-diplosticha*), *monica*.

Humilis, 1—15 centimm. alt. Caulis aculeolis numerosis armatus, haplostiche *vel sub-diplostiche* corticatus ; aculeolis binis fasciculatis, caulis diametrum aequantibus. Folia verticilli 9—10, plerumque 9, haplostiche corticata ; articulis 4—5 (saepissime 5) corticatis, ultimo nudo bi-cellulari ; articulis fructificationem gerentibus 3—4. Foliola omnium geniculorum evoluta, verticillata, sporangio longiora, exceptis duobus brevioribus antheridia lateralibsu, postica vix breviora. Corona stipularis sursum et deorsum evoluta, cellulis elongatis, seriei superioris articulum foliorum infimum aequantibus. Sporangium 11—12-striatum; coronula brevi, sub-connivente; nucleo atro, oblongo, 660μ long., 375—410μ lat., striis a latere inconspicuis (leiopyrena) 9—10.

This very interesting *Chara* was collected by Prof. Macoun of the Canadian Pacific Railway Survey, in July, 1879, in the *brackish* water of the Red-deer Lakes and in ponds west of the Saskatchawan.

From *Ch. crinita*, Wallr., it differs in being monoecious, and in the character of the cortex; but its general habit is exactly like that of *Ch. crinita*, Wallr., indeed among the specimens sent by Prof. Macoun are found a few, apparently dioecious, which I am unable to distinguish in any way from that species.

In *Ch. crinita* a node of the cortex develops a spine from each of the three external cells, so that the spines are fasciculated *in threes*. In this species but two of the cells develop spines, the central cell a long spine and one lateral cell a short one, while the other lateral cell remains undeveloped, or protrudes in the form of a small "button," (Fig. 2, *a*) or elongates somewhat, partially forming a secondary cortex-tube. A section of one of these partially developed tubes is shown in Fig. 3, *a*. Another feature of this plant exhibits its close relationship to *Ch. crinita*, namely, the smaller bracts on each side of the antheridium. In *Ch. crinita* three small bracts stand in front of the sporangium, the central one of which seems to occupy the place of the antheridium; in this place the antheridium occupies just the place of the central bract. *Chara crinita*, developing an antheridium instead of the central bract in front of the sporangium, and a secondary cortex-tube in place of a lateral cortex-spine, would nearly represent *Ch. evoluta*.

Another fact of significance is the discovery of an almost identical and similarly intermediate species in Central Asia. Prof. Nordstedt, in a recent letter to the writer, says: "I have discovered (in Braun's MS.) under *Ch. contraria* some remarks by Braun concerning *Ch. Altaica*, Br., ined. This species seems to stand *very* near your *Ch. evoluta*. Braun writes: 'This seems to me most nearly related to *Ch. crinita*, from which it is clearly different in being monoecious. The cortication of the leaves is like *Ch. crinita*, namely, above and below each bract only one cortex-cell, but under the antheridium there seem to be but two cells. On the stem, the cortex is very remarkable; at times the secondary cells are entirely wanting, at times there is one, at others there are two, but all are never developed, as a section proves. In this respect *Ch. Altaica* varies between the type of *Ch. crinita* and *contraria*, and *Ch. strigosa* and *aspera*; the cells are all very thin as in *crinita*, while in *strigosa* they are thick. The dorsal bracts of the leaf-nodes are elongated, and all the bracts connivent, also a peculiarity of *Ch. crinita*. *Ch. crinita* has, but rarely, traces of intermediate cortex-tubes.'"

From this description it would seem that the Asiatic species had developed slightly farther than the American.

The cortication of the leaf of *Ch evoluta* presents no marked variations from that of *Ch. crinita.* In the latter species there is a regular haplostichous cortication. Even the three small bracteoles have a cortex-tube for each, though often irregularly developed in the lowest node of the leaf, the centre bracteole may send a tube to the base of the leaf and the lateral ones be imperfectly developed; or the lateral bracteoles may send down a tube while the central bracteole may be imperfectly developed between them.

In *Ch. evoluta* the development is also irregular; most frequently in the lowest node of the leaf three tubes are sent down, one from the base of the antheridium and one from each lateral bracteole; but the lateral tubes are usually small and often abortive (as in Fig. 5, *c*) in the upper node. The terminal segment of the leaf is not always two-celled, but sometimes one-celled and not longer than the surrounding bracts.

CHARA EXCELSA, *n. sp.—Euchara, diplostephana, perfecta, diplosticha, monoica.*

Humilis, statura et habitu *Ch. contrariam* aemulans. Caulis aculeolis sparsis armatus, diplostiche corticatus, seriebus cellullularum primariis prominulis. Folia verticilli 7–8, plerumque 8, articulis 5–6, fructificationem gerentibus 2–3; segmento ultimo nudo, bicellulari, saepe elongato; foliis diplostiche corticatis. Foliola omnium geniculorum evoluta, verticillata sporangio longiora, postica vix breviora. Corona stipularis sursum et deorsum valde sed inequaliter evoluta. Sporangium 16–18-striatum, coronula brevi obtusa; collo sporangii elongato. Nucleus ater, ovalis, 15–16-striatus, striis sub-prominulis, 750–800 μ longus.

This plant has the general appearance of *Ch. evoluta* and *crinita*, but is less spinescent. The cortex is almost regularly diplostichous, the primary series being much more prominent. Now and then the secondary series of cells extend past each other, and even additional tubes are developed, as in *Ch aspera*, so that a section of the stem does not show just twice as many cells as there are leaves in the verticil. The spines of the stem are exceedingly variable in length, sometimes more than double the diameter of the stem, sometimes appearing as simple papillae. The stipules are also very irregular in size, some being more than double the length of others, the longest equalling the lowest node of the leaf. The leaves are regularly corticated in two series, and the terminal, naked segment, even in maturer plants, is often much elongated and two-celled. The bracts are verticillate, much longer than the sporangia, and present the general aspect of those of *Ch. crinita* and *evoluta*. The form of the sporangium is quite peculiar in the elongated neck, with short, round, thick cells a the top.

This species was collected in Canandaigua Lake, in August, 1881.

Chara aspera, (Dethard.) Willd.—*Sub-triplosticha, dioica.*—"Usually below medium size and correspondingly slender. Cortex of the stem imcompletely triplostichous, for the cells of the secondary series overlap and unite obliquely; the primary series often somewhat more prominent. (In our American specimens the cortex is extremely irregular, as may be seen by referring to the figures, which are exactly true to nature). Spines single, very variable in number and length, sometimes slender and sharp-pointed, sometimes short and very blunt. Stipules usually quite large but variable (in var. *Macounii*, Allen). Leaves 6 to 11 (usually 8) in a verticil, consisting of 3 to 7 (usually 6) corticated internodes and a naked tip, sometimes two-celled. Bracts on all the nodes; on the upper sterile nodes shorter, often inconspicuous; on the fertile nodes of the female plants there are usually 3 shorter, posterior, and (including the main bract, in place of the antheridium) 5 longer anterior bracts; of these the main bract is sometimes shorter, sometimes longer than the others. On the male plant the bracts are in general shorter than on the female, usually only two long anterior bracts, by the side of the antheridium. Sporangium oblong, with a short, broad, truncated coronula. Nucleus black, with inconspicuous angles, 440–500 μ long; striae on one side of the sporangium 14–16, on the nucleus 13–14. On the subterranean parts of the plant, small globular bulblets."

"Very variable in size and vigor, but usually with very slender stems, and slender leaves, mostly straight and rigidly spreading, rarely curved outwardly or inwardly. Color a clear green, light or dark, usually grayish with incrustation when old; in salt water more vigorous, yellowish or browish green and but slightly incrusted. The length of the leaves varies greatly, but very long leaves are unknown, while there are short-leaved forms (forma *brachyphylla*). The bracts are sometimes much longer than the sporangia, sometimes of equal length or even somewhat shorter; also the spines, always slender and straight, are often several times longer than the diameter of the stem, equal to it or shorter, rarely so short as to be almost unnoticed (forma *sub-inermis*). In young plants the terminal naked segments of the leaves may be greatly elongated (*Ch. fallax*, Ag.) On all forms, but most frequently on those growing in fresh or brackish water, are found chalky-white, globular tubers, which are situated on the nodes *of the rootlets*, seldom on the subterranean, defoliated and decorticated nodes of the stem; these are sometimes single, sometimes in groups of 2 to 5 and are nothing else than modified rootlets, formed of a single cell, filled with starch granules. Sometimes an ordinary filiform rootlet bears at its tip one, or even a whole bunch of such tubers. While the upper part of the plant dies in winter, these rootlets survive and give rise to new shoots, from the upper extremity of the tuber, or from a root-node on which the tuber is borne. Male and female plants are equally common and are found together." (A. Braun.)

The above comprehensive description, by Prof. Braun, embraces a great variety of forms from different countries. The forms of true *Ch. aspera* hitherto found in America are from New Mexico (Wright, 1857, No. 561); Long Island (Allen, 1860–1881) and Canada (Prof. Macoun, Canadian Pacific R. R. Survey, 1879–1880; brackish ponds west of Saskatchewan, etc.) All of these collections belong to the long-bracted and long-spined form, except the following marked variety, which I had ventured to consider a distinct species:

Var. MACOUNII, (*Ch. Macounii*, Allen *in litt.*)—Caulis aculeolis sparsis, inconspicuis, sub-inflatis obtusis armatus. Folia verticilli 6–8, plerumque 8; articulis 8, internodiis elongatis; sinistro torta.

Sporangium 10–12-striatum, coronula connivente, nucleo 8–9-striato. Foliola anteriora 3, sporangio multo breviora, posteriora inconspicua. Stipulae minutae. Nucleus niger, 450–475μ longus. Antheridium 550μ diametro.

The striking peculiarities of this variety are the torsion of the leaves (to the left, upward); the minute blunt spines; small stipules and very short bracts; the connivent cells of the coronula; and the small nucleus with fewer angles. All these differences would readily serve to distinguish this form as a distinct species, were it not for the fact that the *aspera* group is already large and its individuals difficult to distinguish. Doubtless they all have a common origin, and the variations are such as differences of climate, water, etc., determine. I have not found any bulbs on the specimens from Prof. Macoun, nor indeed, were any found on his *Ch. aspera*, nor did I succeed in collecting them on Long Island. The plants in this country seem to be in fruit in mid-summer. Our female plants seem to be longer leaved with more open verticils; and the male plants have, for the most part, shorter incurved leaves with one less node. The variety *Macounii* differs but little from *Ch. fragifera*, Dur., which is dioecious, has small bracts and stipules and long and slender twisted leaves; but the cortex is *perfectly* triplostichous. A long-leaved form of *Ch. fragilis*, Desv., sometimes has twisted leaves (forma *streptophylla*=*Ch. Hedwigii*, Ag.)

Chara fragilis, Desv., (*Ch. vulgaris*, L., in part).—*Triplosticha, monoïca.*—"Medium size, relatively slender and rather rigid. Stem completely triplostichous and *symmetrically corticated, smooth*. Leaves in a whorl, 6–9, usually 7–8, for the most part slender and rigid, with 5–8 corticated segments and a very short tip of 1–2 naked cells. Stipules commonly very small, consisting of two series of small papillae, the cells of the upper row larger, those of the lower smaller and only partially developed. Bracts on the dorsum of the leaf obsolete; on the upper sterile nodes all are often undeveloped; the anterior bracts of a fertile node, usually 4 in number, including the prebracteoles, are sometimes shorter, sometimes equal to, sometimes longer than the fruit, and the two anterior (prebracteoles) are always the longer pair. Antheridia and sporangia single. Fruit oval or elongated, larger than *foetida* and *aspera*. Coronula elongated, with a conical, connivent or erect, rarely slightly divergent, tip. Incrustation thin. Nucleus black, elongated, with sharp angles and sharp spines, 550–660μ long. Striae on one side of the sporangium 15–16, on the nucleus 13–14. Usually of a fine green color, often a dark lake-green, always somewhat incrusted, when more incrusted grayish-green, and when dry whitish-gray (*Ch. hirta*, Meyen). The incrusted forms are very brittle. On the leaves of the sterile verticils there are scarcely any bracts. In deep water the species is perennial, living by means of sprouts from the lower nodes of the stem; in drier places, annual. Very variable in size, length and thickness of leaf (forma *longifolia* et *brevifolia*, *tenuifolia* et *crassifolia*) as well as the length of the bracts, which has given rise to numerous untenable species." (A. Braun.)

This species, like *Ch. foetida*, A. Br., is found all over the world, but rarely in salt water. In the United States it seems to be the most common species, being reported everywhere. It grows to a considerable length, with long slender leaves, in running water, or becomes very small and compact in still ponds. Multicellular tubers are formed on the lowest nodes.

Specimens have been found as follows: Maine, Prof. O. D. Allen. Vermont, at Charlotte (forma *microptila*), Mr. Pringle; in Willoughby Lake (*tenuior longifolia*), Messrs. Horsford and Faxon; at Ferrisburgh, Mr. Faxon. Massachusetts, at Boxford, Messrs. Faxon and T. F. Allen; at Natick and Cambridge, Mr. Faxon; at other places by Rev. Mr. Morong. Connecticut, at New Haven, Prof. O. D. Allen; in Litchfield County quite common, T. F. Allen. New York, at Albany, Mr. Peck; at Penn Yan (forma *macroptila* var. *barbata*); in the lakes of Western New York, especially in Hemlock and Honeoye Lakes, and common in the lakes in the Adirondacks, T. F. Allen. Illinois (forma *longifolia major*, var. *Hedwigii*), Dr. J. Schenck. Iowa, J. C. Arthur and Prof. Bessey. California, Dr. A. Kellogg (forma *macroptila*). Yellowstone Park, in the hot Geyser Springs, *temperature* 100° *F.*, finely in fruit, but with only two elongated bracts, the lateral bracts very minute, herb. Gray, collected during Hayden's Survey.

(*Ch. delicatula*, Ag., by some considered a variety of *Ch. fragilis*, grows in Fort Pond, Montauk Point, Long Island. It is incompletely triplostichous; the stem is armed with small spines; the stipules are well developed; and the bracts are verticillate, but the dorsal ones small. Intermediate forms are known between this species and the typical *fragilis*.)

Description of Plate xvii, *Ch. inconnexa*. A represents the plant, natural size. Fig. 1, a lower sterile verticil. Fig. 2, a higher verticil with naked leaves and with one node fertile, one quite sterile, and the stem corticated with a disconnected series of primary, node-bearing cortex-tubes. Fig. 3, an upper verticil, showing three (of the seven) leaves, one with a single fertile node, with the lowest internode corticated like the stem; one with two fertile nodes, the lower of which has a perfect double cortex, the upper an imperfect cortex, and one sterile leaf without any node whatever. Fig. 4, a section of the stem showing the relation of the cortex-tubes to each other. Fig. 5, the terminal articulation of a leaf with its short mucronate cell. All the figures are magnified 100 diameters.

Explanation of Plate xviii, *Ch. crinita*.—A represents the normal size of the plant. Fig. 1, a portion of the stem with triple spines (less numerous than in nature, when they completely hide the stem); large double stipules equalling the lowest joint of the leaves; the long, verticillate bracts; the short coronula of the sporangium; and, at *a*, the three bracteoles subtending the sprorangium. (The male plant I have never seen.) Fig. 2, terminal nodes of a leaf, showing the one-celled, naked terminal, surrounded by long bracts. Fig. 3, a section of the stem. Fig. 4, a nucleus from Montauk Point (forma *pachysperma*). Fig. 5, nucleus from Nantucket (forma *leptosperma*).

Explanation of Plate xix, *Ch. evoluta*.—A and B represent the natural size of the plant; B though small is perfectly mature, with full-sized sporangia. Fig. 1, the stem with double spines, double stipules and one leaf with three fertile, two sterile nodes and a two-celled, terminal, naked segment, magnified 30 diameters. Fig. 2, a portion of the stem, showing at *a*, *b*, and *c* the partial development of one cell of a cortex-node into a cortex-tube, magnified 30 diameters. Fig. 3, a section of the stem, showing at *a'* a section of one of the incompletely developed secondary cortex tubes. Fig. 4, the point of one of the bracts (or spines) magnified 120 diameters. Fig. 5, the anterior aspect of a leaf (the two lowest nodes) showing at *a*, *a*, the site of the antheridium; at *b*, *b*, the central cortex-tube, in the lower node covering the whole segment but tapering below, in the upper node extending down to fill the gap above the sporangium ; at *c*, *c*, lateral tubes, in the lower node dilating below, in the upper, larger above, on the right and on the left nearly obsolete ; at *d*, *d*, regular tubes from the bract. The group of three tubes arises from *one bract-node* of the leaf. The exact development of cells at the base of this node is not known ; it seems to have some peculiarties which require investigation with fresh specimens. Figs. 6 and 7, nuclei with faint striae.

EXPLANATION OF PLATE XX, *Ch. excelsa.*—A, plant natural size. Fig. 1, stem and verticil, showing variable cortex-spines and stipules. Fig. 2, a section of the stem, showing slight deviation from a regular diplostichous type. Fig. 3, two nodes of a leaf, with verticillate bracts. Fig. 4, terminal node of leaf with an elongated, naked, two-celled tip. Fig. 5, tip of one of the bracts (magnified 250 diameters). Fig. 6, one of the mature sporangia, showing the elongated neck, and short, blunt cells of the coronula. Fig. 7 and 8, mature muclei, with 15—16 sub-acute angles. The figures (except Fig. 5) are magnified 35 diameters.

EXPLANATION OF PLATE XXI. *Ch. aspera.*—A, a male plant of the ordinary form (from Long Island), natural size. B, a female plant of var. *Macounii*, natural size. Figs. 1–3, from normal form (*macroptila*). Fig. 1, a portion of the stem, showing the irregular formation of the cortex, and the base of a verticil showing the large stipules. Fig. 2, portion of a leaf bearing sporangia, with long verticillate bracts ; coronula somewhat divergent. Fig. 3, portion of a leaf from the male plant. Figs. 4–6, from var. *Macounii.* Fig. 4, stem, verticil and portion of leaf of a female plant, showing small blunt spines, irregular cortex, minute stipules, minute bracts, connivent coronula and the torsion of the leaf. Fig. 5, part of leaf of male plant. Fig. 6, terminal node of a leaf (not always with a *two*-celled naked segment, but often only one-celled). Fig. 7, a cluster of bulblets from the rootlets of a European specimen. These consist of a simple sack filled with starch granules of varying size, the largest averaging 70 μ in diameter, the interstices between the larger granules being densely packed with smaller ones. Fig. 7, *a*, one granule magnified 100 diameters, showing a black cross with polarized light. Figures all magnified 40 diameters.

EXPLANATION OF PLATE XXII, *Ch. fragilis.*--A, plant natural size with bulblets at the underground nodes. B, a verticil and leaf magnified 25 diameters; 8 and 9, and 8*a* and 9*a* showing two terminals, the single-celled one more common. C, an enlarged bulb, and a section showing numerous cells filled with starch granules. D, a node beginning to deposit starch in the nodal cells. The starch seems to form in the extremities of the main tubes of the stem, in the base of the leaves and in the cells surrounding the base of each leaf, thus giving rise to a very complicated tuber. The thickening of the tuber around the base of the leaves is well shown in the magnified tuber. Fig. 10, a nucleus.

On the Development of the Root-stock of Dicentra cucullaria.

By JOSEPH SCHRENK.

(Plate XXIII.)

When we examine this plant in December or January, we find that many of the singular bulblets of which the bulk of its subterranean portion consists, begin to push forth buds from near their bases, on the inner side (toward the axis). At this time we find these buds in various stages of development: some are mere protrusions above the epidermis, others show plainly one or two rudimentary leaves surrounded by several scales or bracts (Plate XXIII, Figs. 1 and 3). The more advanced buds have an elongated axis beset with large membranaceous bracts, which, overlapping one another, envelop the axis. In the axils of these bracts there are found miniature bulblets, either singly or in clusters, shaped like the large ones from which the buds have started; only at their upper end we discover a rudimentary, but very plainly tripartite leaf-blade incurved toward the axis (Fig.

4, *bb.*, and Fig. 5). This rudimentary blade attains a greater size and development on those bulblets that grow at the top of the axis.

In every vigorous shoot we find, near the end of the axis, one, or often two leaves which are so far advanced in growth that the entire structure of the full-grown *Dicentra* leaf is plainly discernible. They even have a greenish tinge, although closely wrapped up by the bud-scales and growing under ground. But besides having an almost fully developed lamina, such perfect leaves are remarkably different in regard to their petioles from the ones with only rudimentary blades. With these, the bulblet itself is simply a greatly enlarged, roundish-triangular leaf-stalk, bearing at its top a mere vestige of a lamina, while the well-developed blade of the former is borne on an elongated, typical petiole, which only at its very base presents an evident, though comparatively slight swelling (Fig. 4, *pt.* and Fig. 6, *a.*) At the flowering time (in April), when the leaf-blades have fully expanded this slight swelling of the petiole-bases has increased enormously (Fig. 7.); and when in summer the foliage has withered away, these enlarged petiole-bases persist and help to form the singular subterranean stem of our plant. They then remotely resemble beech-nuts in size and shape, but the edges are not so sharp, and the inner side is flat. We can easily recognize them by the triangular, dark brown scar left at the top where the thinner part of the petiole has withered away.

The minute bulblets, which I mentioned above as growing in the axils of the bracts on the elongating axis, do not develop their rudimentary leaf-blades at all, but soon lose nearly every trace of them, retaining only a small incurved point at the top But their mass increases very considerably, while the axis to which they belong, and at the top of which the real leaves are growing, does not lengthen in proportion, so that at the end of the growing season these bulblets are found crowded under and around the large persisting petiole-bases described above. Their outer sides are not concave, but rather convex (Fig. 2), and in size they vary very much, some being as small as millet or hemp seeds, while others are as large as grains of wheat or even of corn. They have of course no scar at the top, the initial blade of their early stage of development having been absorbed or transformed into a smooth blunt point.

On the ground of these observations we might distinguish two sorts of "granulate bulblets" growing on the root-stock of *Dicentra cucullaria*, viz., 1st, metamorphosed petiole-bases, and 2nd, abortive leaves. Their physiological functions are, no doubt, identical; and, in regard to structure and contents, there is not much essential difference; the bulblets of both kinds contain numerous fibro-vascular bundles scattered through the bulk of large parenchymatic cells that are crowded with starch-granules; but in bulblets of the first kind there are from three to five strong principal fibro-vascular bundles (Figs. 6 and 7) while there are no such fibres in those of the second kind (Fig. 2).

Every one of these bulblets is provided at its base with a bud, which eventually produces a new axis during the next season, while, at the same time, new axial organs spring from the main stem. It is, therefore, evident, that an old root-stock will form a conglomeration of branches, and will have a coral-like appearance when the bulblets are removed.

It is not quite easy to decide from actual observation, whether the buds morphologically belong to the bulblets, or to the axis on which the latter are inserted. In the former case, we should have one of the rather rare occurrences of abnormal bud-production from petioles. But, I think, we can plainly distinguish a narrow zone of tissue in the bulblet at the point of its insertion, that morphologically belongs to the axis. But this zone, from which the incipient bud is differentiated, is, together with its bulblet, very easily detached from its axis, and then gives rise to a new individual plant.

EXPLANATION OF PLATE XXIII.–(For figure of entire plant see Gray's Struct. Bot. p. 204, where, however, the thin portion of the petiole ought to be represented as proceeding from the *top* of the bulblet.

Fig. 1. longitud. sect. of last year's bulblet with bud at the base (December). Fig 2, cross-sect. of the same.—Fig. 3, the same with elongating axis; *lf*, leaf; *br*, bracts.—Fig. 4, longitud. sect. of vigorous shoot (in December) separated from root-stock, the large lower bracts removed; *rt*, root breaking through overlying tissue; *bb*, new bulblets in axils of upper bracts; *pt*, petiole-bases (the blades belonging to them are cut off); *a*, end of axis, all magnified. Fig 5. cluster of bulblets between two bracts (in December), taken from the axil of a lower bract on shoot in Fig. 4. Fig. 6,* sections of petioles in December, and Fig. 7, in April: *a*, longitud. sections showing bud at base; *b*, cross-section from base, *c*, from middle and *d*, from top of thickened portion; *e*, from upper (thin) part of petiole.

New or Little-Known Ferns of the United States. No. 12.

By D. C. EATON.

36. *Polypodium Swartzii*, Baker.—Rootstock very long and slender, chaffy with narrow ferruginous scales; fronds scattered, short-stalked, thin-membranaceous, smooth, oval to linear-lanceolate, ½ to 5 inches long, 3 to 5 lines broad, entire or sinuate; veinlets visible, reticulated, paracostal areoles long and narrow, next ones much larger, oblique, outer ones much smaller and irregular; fertile fronds longer than the sterile, and soriferous on short included veinlets in the largest areoles only, the sori thus in a single row each side of the midrib. Syn. Fil., p. 357. *P. serpens*, Swartz, Mettenius, Hooker, but not the *P. serpens* of Forster.

Climbing on stems of shrubs and small trees, often several feet above the ground; at the north end of Key Largo, Florida; A. H. Curtiss, Feb. 21, 1882.

I have to thank Mr. Davenport for a specimen of this interesting little fern. It was discovered in Santo Domingo nearly two hundred years ago by Plumier, who gave but a slightly exaggerated figure of it under the name of "*Lingua Cervina scandens, angustis et undosis foliis.*" He remarked that the fronds are all drooping because of their very slender stalks. Linnaeus gave no account of this plant; but it has been recognized by most later writers on the West India ferns. I have specimens from Santo Domingo (Weinland, 33), Cuba (Wright, 799) and Porto Rico (Garber, 41).

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* Fig. 6, the lettering of which was accidentally omitted, is to the right of Fig. 7.

Mr. Davenport informs me that Mr. Curtiss has collected a large stock of this fern, and will distribute it in his fascicles for 1882, which will probably contain also *Asplenium serratum*, *Taenitis lanceolata* and the royal palm, *Oreodoxa regia.*

37. *Pellaea densa*, Hooker.—The range of this fern is greatly extended by Prof. O. D. Allen and his son, Mr. J. A. Allen, who found it on Mount Albert, in Lower Canada, July 30, 1881. It grew exposed to the sun on the steep walls of ravines at 2,000 to 3,000 feet elevation. Mt. Albert is near West Longitude 69° 30′, N. Lat. 47° 15′. The same plant is No. 819 of Mr. Cusick's Oregon distribution.

38. *Phegopteris calcarea*, Fée.—A second station for this very rare plant is at Decorah, Winneshiek Co., Iowa, where it was found last season "in the crevices of the north side of a limestone bluff" by Mr. E. W. Holway. My specimens were kindly sent by Mr. J. C Arthur, of Charles City, Iowa.

39. *Aspidium aculeatum*, var. *scopulinum*, Eaton.—This has been reported in the BULLETIN from Utah, by Mr. M. E. Jones. The Messrs. Allen collected it July 26, 1881, on the side of a rocky ravine on Mount Albert, Lower Canada. Mr. Suksdorf sends it also from Mt. Adams, Washington Territory. Some of Mr. Lemmon's plants seem to show so gradual a transition of this into *A. mohrioides*, that it would look as if the latter would have to be considered an extreme form of *A. aculeatum.*

40. *Aspidium trifoliatum*, Swz.—Mr. Curtiss has now distributed fine specimens of this tropical fern. Mr. Davenport has received from Dr. Engelmann a specimen collected long ago in Western Texas by Lindheimer. That region of Western Texas has scarcely been visited by botanists for many years, and not a few of our rarest ferns are found principally there.

41. *Woodsia obtusa*, var. GLANDULOSA, is the name suggested by both Mr. C. E. Faxon and myself for the form called *W. Plummerae* by Mr. Lemmon. The involucre is exactly that of *W. obtusa*, the habit scarcely differs, and the glandular pubescence is so variable, often almost lacking, that no reliance can be placed upon it for a specific distinction. This fern has been badly mixed by collectors with *W. Mexicana.* The affinity of the latter is rather with *W. scopulina.*

42. *Ophioglossum vulgatum*, L.—Falcon Valley, Washington Territory, Suksdorf, 1881. Mr. Davenport kindly sends me this, and with it very immature plants of what is probably the same thing from near San Diego, just collected by Dr. Parry.

Torenia Asiatica is a pretty little hot-house plant of trailing habit, which will thrive excellently well out-of-doors during the summer. It has a prismatic calyx, two-lipped, and with sharp angles. The corolla is "short, funnel-form or tubular, with an inflated throat, 4-lobed, the upper lobe (sometimes slightly notched) outermost in the bud." The extreme portion of all but the upper lobe is of a deep violet-purple, shading below into lavender, but with the dark color resumed in the throat. The lower lobe shows a sort of arched portion extending down towards the ovary. With the exception of this conspicuous dark margin, it is of much lighter color than the rest of the corolla.

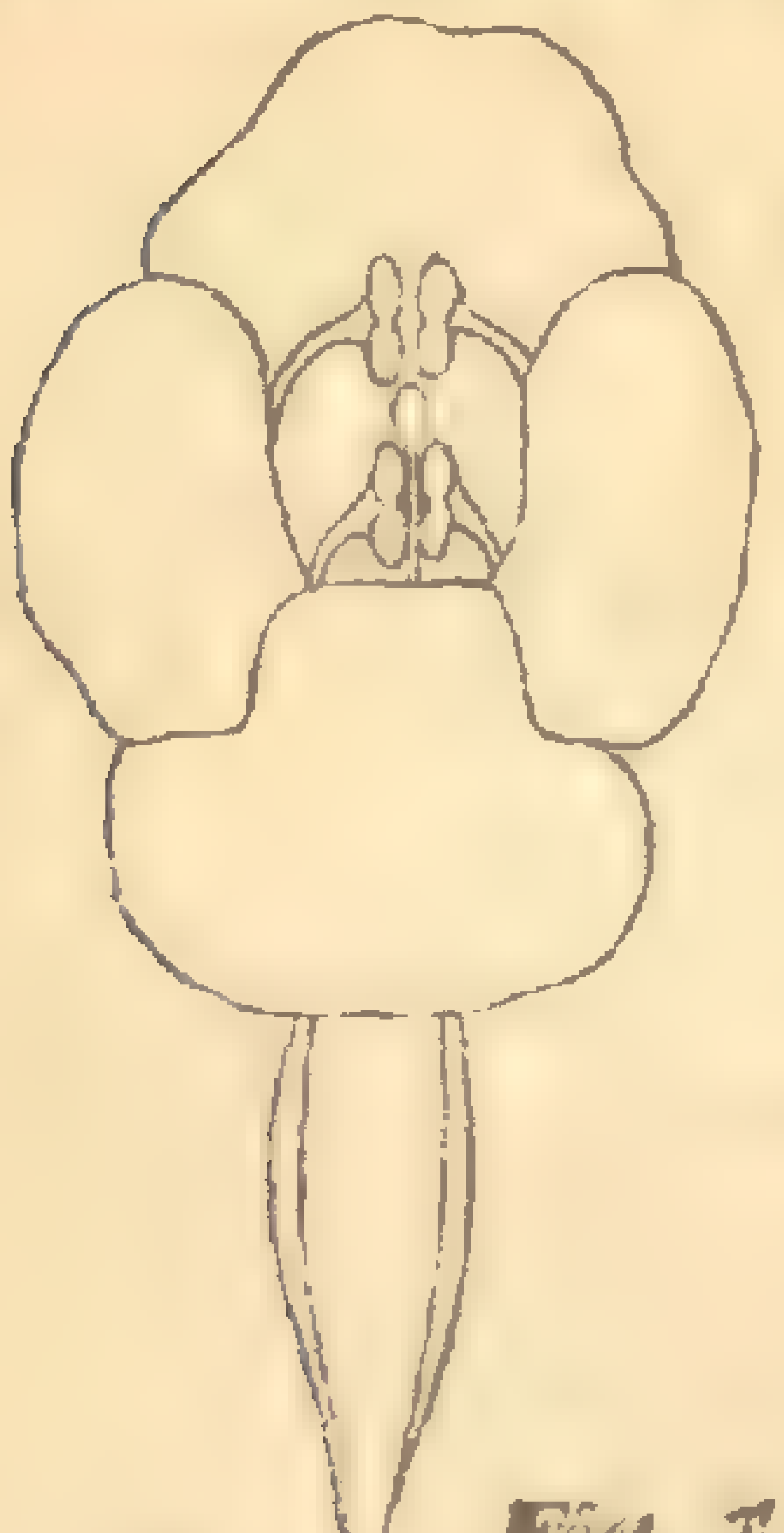


Fig. 1.

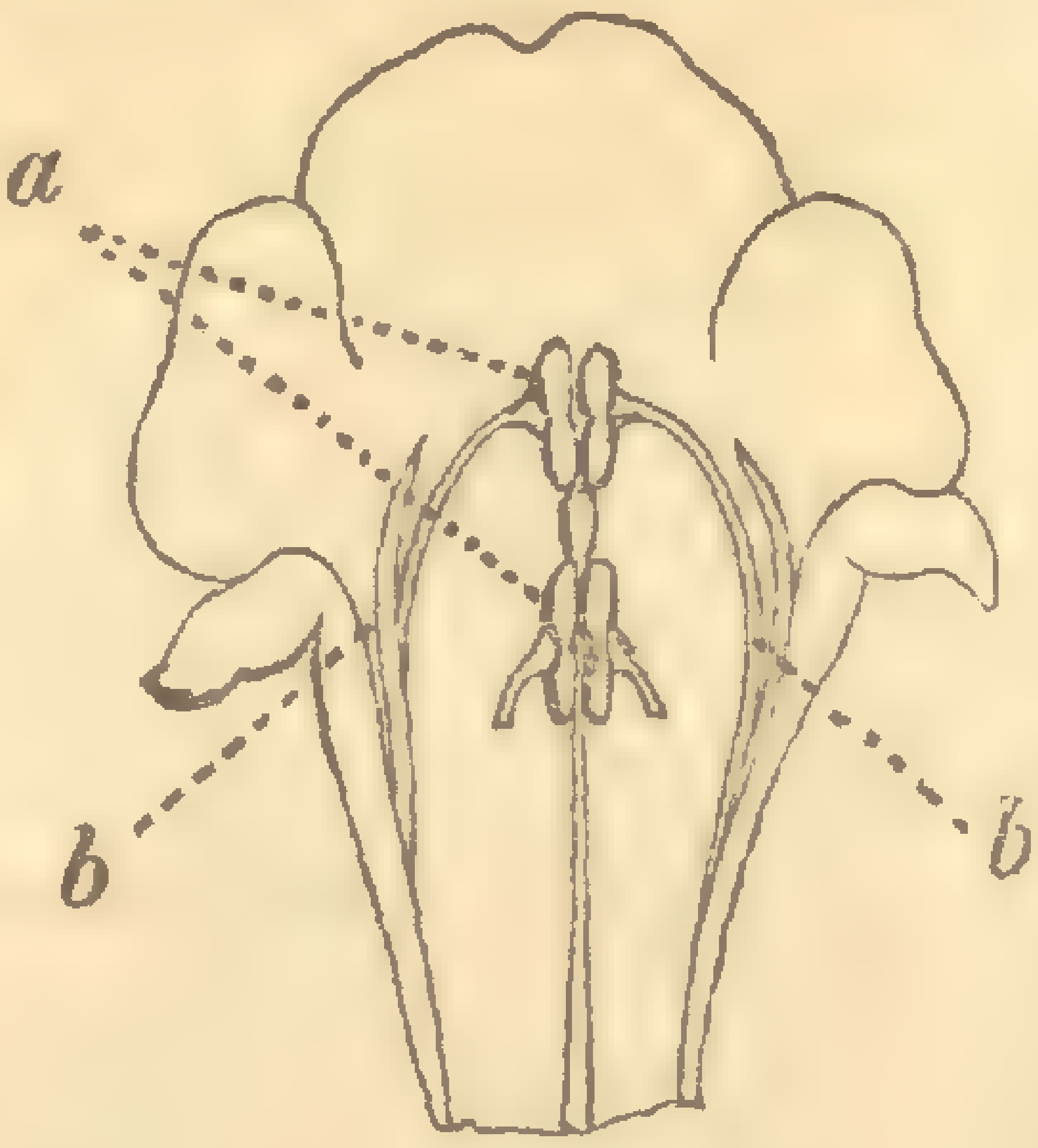


Fig. 2.

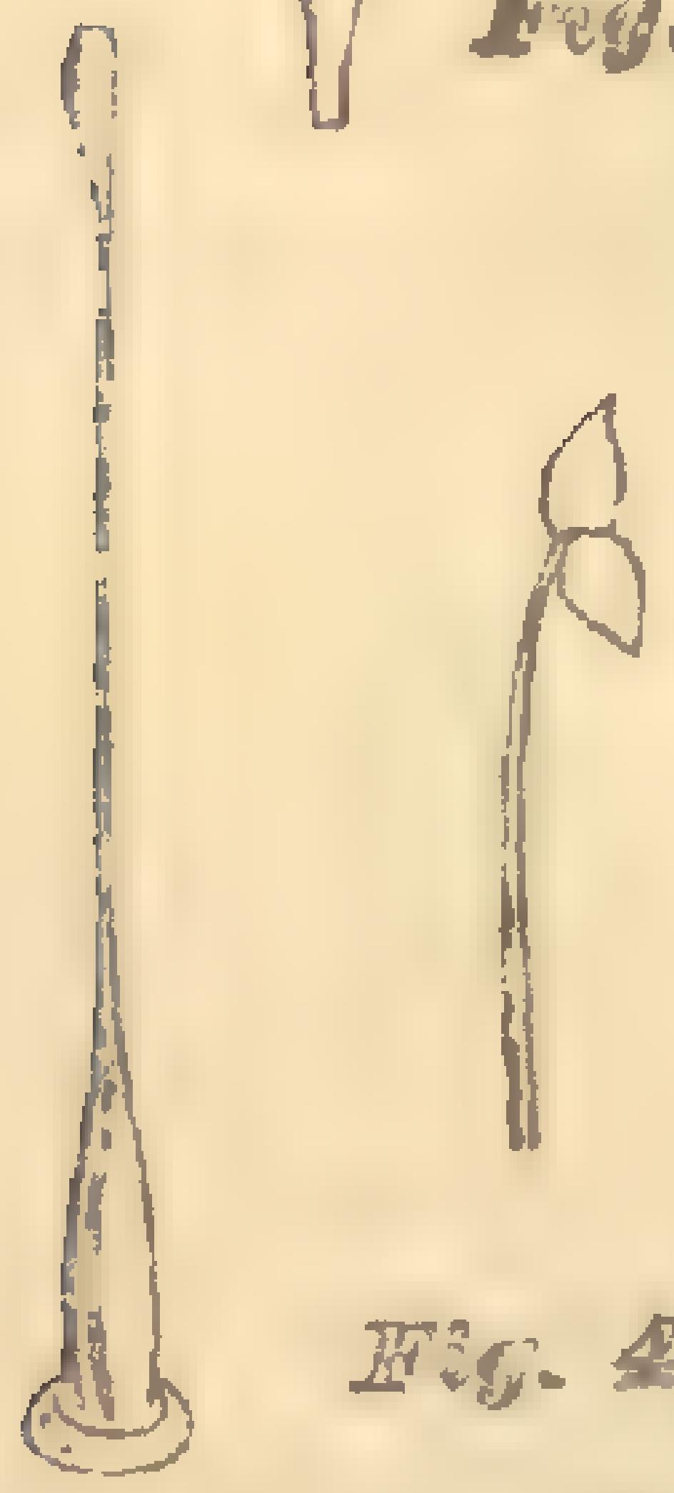


Fig. 4.

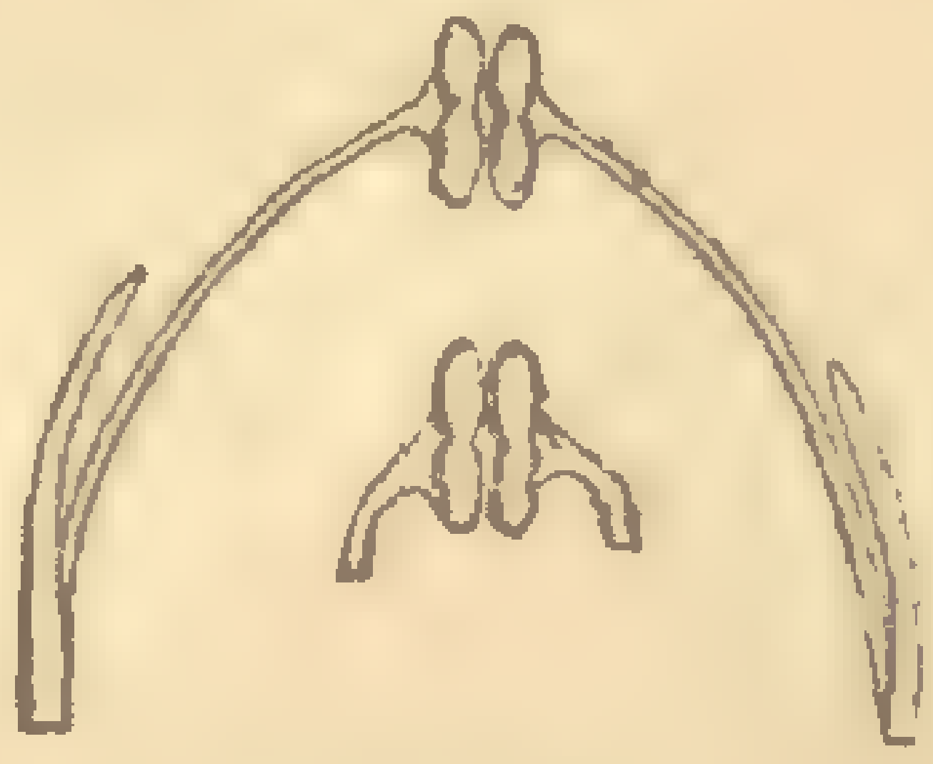


Fig. 3.

One who has given any attention whatever to the cross-fertilization of flowers by means of insects, would at once suspect this plant of some neat mechanism. The irregular and showy corolla and the peculiar stamens warrant an investigation. The stamens (didynamous) are extremely unequal in length. The lower pair arches and converges under the upper lobe of the corolla, in the form of a bow, while the shorter pair is included in the tube. Both have the anthers contiguous and, indeed, quite coherent,[1] so that it requires some little effort to separate them. The lobes in either pair are so far divergent as to present themselves end to end, in a vertical position. The connective is large and broad. Each of the outer pair of filaments shows some distance above its adnation to the corolla, a filiform appendage, pointing forward and slighly inward. Pressure upon these, one at a time, or better, upon both simultaneously, at once deflects the staminate bow, which, upon removal of the exciting force, resumes its normal position. It would seem as if a large insect like a bee, visiting this flower, and alighting upon the convenient platform of the lower corolla-lobe, and straddling its arch, as he would have to do, would of necessity touch the filiform processes, depressing these little levers, and by throwing the anthers forward, receive more or less pollen on his back. I take the flower to be proterandrous, and think the anthers of the larger stamens open first. I have assured myself of the fact that the two-lipped stigma[2] does not open until at least the second day after anthesis. It then bends forward from its hitherto erect position. The style is kept in place by the shorter stamens, which themselves form a bow, as will be seen in the figure. They do not, however, prevent the deflection of the stigma. Around the base of the ovary is an annular disk, within which a shallow cup is formed, perhaps containing nectar, but this I have not proved. The shorter pair of stamens, it should be said, has no appendage.

It so happens that my attention has been directed to *Torenia* so late in the season that I have not been able to determine what kind of insects would here visit it. What is here written is merely to

1 - [illegible]
{Meehan; Proc. Phil. Ac. 1871, 118.

2 - [illegible] II, 2, [illegible].

direct attention to the plant, which I cannot but think exhibits a pretty adaptation of means to ends.

Fig. 1 represents a front view of the flower. Fig. 2 shows the corolla laid open so as to display the filiform appendages *a*, and the anthers *b*. Fig. 3 represents the androecium. Fig. 4 shows to the left the gynoecium, and to the right the magnified stigma.

Brown University, Providence, R. I. W. WHITMAN BAILEY.

Notes on Andropogon Jamesii, Torr.—Dr. Torrey described this grass in the Annals of the New York Lyceum, Vol. i, 1824, p. 153, from specimens obtained by James on the Canadian River, and named it *A. glaucus.* Muhlenberg having already given this name to another species, Dr. Torrey changed his *glaucus* to *Jamesii* in Marcy's Report, 1852. Steudel, in his Synopsis Plantarum Graminearum, p. 392 (1855), probably not knowing of the second name given by Dr. Torrey, called it *A. Torreyanus*, under which name it has been distributed by American collectors: (No. 845 E. Hall, Texan Plants, No. 3635* A. H. Curtiss's distribution N. Am. Plants, and in the recent distribution of "Pacific Slope Plants" by Pringle.) T. S. Brandegee collected this grass at Cañon City, Colorado, and it was called in "Flora of Colorado," *A. argenteus*, Ell.

In comparing my specimens with Grisebach's description of *A. saccharoides*, Sw., there appear to be no essential points of difference, and as he (in Flora of the British West Indies) cites Arkansas and New Mexico among the habitats of this species, the supposition is that he includes with it our *A. Jamesii*, Torr. By the kindness of Mr. Watson I have been enabled to compare the spikelets of the *A. saccharoides*, Sw., (*fide* Grisebach) with those of our *A. Jamesii*, or *Torreyanus*, and the opinion that they were of one species seemed to be confirmed. The only difference noted was that in the West Indian *A. saccharoides* the hairs on the rachis were a little shorter, the fertile spikelet a little longer and the leaves pilose near the base, differences of no specific importance. In a lot of specimens of *A. Jamesii* from Texas there was a considerable variation in the size of the panicle. It is well known that many species when growing in the dry regions of the Southwest become highly glaucous when elsewhere they are not at all so.

Supposing our *A. Jamesii* to be the same as *A. saccharoides*, Sw., and I believe that it is, then Torrey's name must give place to that of Swartz, and we would have:—

Andropogon saccharoides, Sw., Flor. Ind. Occ. i, 205. (1797).
=*A. argenteus*, D C.. Cat. Monsp. 77 (*teste* Nees).
=*A. glaucus*, Torrey in Ann. Lyc. N. Y. i., p. 157. (1824).
=*A. Jamesii*, Torr. in Marcy's Report. (1852).
=*A. Torreyanus*, Steud. Syn. Gram., p. 392. (1855 .

Description:—Culms simple or branched and geniculate below, smooth except at the nodes, which are sometimes pubescent with stiff, erect or appressed hairs; sheaths smooth, shorter than the internodes; ligule obtuse, a line long. Leaves smooth or pilose near the base, 3-6 inches long, 1-3 lines wide, with very accuminate-pointed and minutely scabrous tips—the upper leaf very narrow and usually less than one inch long. Panicle long exserted, $\frac{1}{4}$ of an inch long, the numerous erect or but slightly spreading branches single or in pairs, simple or branched, varying in number and length, smooth below. Rachis of the spikes jointed, each joint $1\frac{1}{2}$ lines long, flattened, densely bearded on the edges, hairs at the base of each spikelet a little shorter than or (usually) exceeding it by a line or so. Pedicel of the neutral floret flattened and bearded like the joints of the rachis, 1–2 lines long. Outer glume oblong-lanceolate, flattened on the back, $1\frac{1}{2}$ to a little over 2 lines long, 7–9-nerved, more or less silky villous below, smooth above, strongly scabrous near the tip and on the upper portion of the angle made by the infolding of the narrow margin; second glume a little shorter and more pointed than the first, 3-nerved, ciliate on the inturned margin, very smooth on the back; third glume neutral and without a palea, very thin and transparent, oblong, obtuse, 1–$1\frac{1}{4}$ lines long; fourth glume without a palea, fertile scarcely wider than the long (5–6 lines) twisted and more or less geniculate scabrous awn into which it passes. Rudimentary floret of a single empty lanceolate glume $1\frac{1}{4}$–2 lines long; a second glume and sometimes also an imperfect awn is present.

Dr. Torrey, in his description, says: "Nodes smooth, leaves very smooth on both sides, stipule obsolete, palets two, shorter than the glumes, the lower terminating in a slightly contorted awn. The other portions of Dr. Torrey's description agree with that given above. He mistook the nature and relative position of the "palets," or as he had it, "*corolla*," which he said was "two-valved." There are two valves within the two outer glumes, but they are the lower palets of two flowers, the lower one being neutral, and both destitute of upper pales; and it is the upper one which is awned.

F. LAMSON SCRIBNER.

Notes on the Trees of the South-west.—The San Francisco Mountains here mentioned are in the extreme eastern part of Arizona, just north of the Gila and west of the San Francisco River. The Burro and the Bear Mountains extend in a north-westerly direction, from points a little to the west of Silver City, to the Gila River, being separated from one another by the Mangus basin. The Bear Mountains are the northern ones. The Mogollon Mountains are situated in the extreme western part of New Mexico, between the Gila and San Francisco Rivers, a little north-east of the San Francisco Mountains.

The only wooded sections are in the mountains, and the hills near them, and along the streams.

Fouquiera splendens, Engelm.—This plant, although a shrub, is introduced here on account of the general use to which the wood is put by the Mexicans. It is very peculiar, and, in flower, it is handsome. It is commonly known as "coach-whip cactus," or simply "coach-whip." It is very largely used by the Mexicans in South-western Arizona for fencing, the poles being set up contiguously in trenches, and bound by a row placed horizontally near the top. The thorns render such a fence impassable. The plants are also occasionally used for roofing-poles.

Prunus Capollin, Zucc., is, with the exception of the mahogany, the only fruit-tree that I have found in the South-west, and the fruit of this is poor enough. It grows in the rich, light soil of the cañon-bottoms, attaining a size a little greater than that of *Prunus Virginiana*. It is very prolific.

Sapindus marginatus, Willd., is known in South-western New Mexico as "China tree." It grows with a single straight trunk, and reaches a height of 10 or 12 feet, and occasionally has a diameter of 6 inches. The fruit is said to be of value in malaria. I have sometimes had occasion to use the wood for ramrods, and have found it very light and strong. It grows in light soil along streams and valleys at the base of the mountains.

Negundo aceroides, Moench., grows commonly along mountain streams. It reaches a diameter of about 12 or 15 inches.

Prosopis juliflora, DC. — Legumes extensively used for horse-fodder, when grain cannot be obtained.

Fraxinus pistaciaefolia, Torr.—This polymorphous species is abundant along all mountain streams, in rocky places, often growing in rock-crevices where no soil is apparent, with its feet variously flattened and deformed to fit the crevices. The leaves vary much as to form, margin and surface, being from ovate-oblong to obovate, and from glabrous to short tomentose. Like most of the hard-wood timber of the Gila country, it is very subject to decay, but when sound it is highly valued for the purposes for which white ash is commonly used. It is apparently the material of which the prehistoric people of the Gila formed their bows.

Chilopsis saligna, Don., grows only near water, and delights in a sandy soil. It is one of the most beautiful of trees when in flower. It occasionally has a diameter of nearly or quite a foot. The wood resembles that of the black walnut in color, though somewhat lighter and with a satiny gloss. It would apparently be valuable for cabinet-work, as it is beautiful, and capable of taking the peculiar and handsome polish of sumac.

Celtis reticulata, Torr.—This species was observed only in the Burro Mountains. The wood is very white, smooth, sound, compact and heavy, and would apparently be valuable for turning purposes. The trunk is very short, seldom reaching a height of more than three feet before forking, and the branches are crooked and branching, so that no large pieces of the wood are available.

Morus microphylla, Buckley.—Very common in open cañons of the Burro Mountains, and mountains southward. It reaches a height of 20 feet, and a diameter of 6 to 9 inches. The fruit, though small, is sweet and pleasant when ripe. The trunk is variously flattened, twisted and distorted, and the bark is seldom entirely continuous except in small specimens.

Platanus Wrightii, Watson.—Common and abundant in the mountain cañons, being the predominant tree of the cañon of the Mogollon Mountains. The trunk is usually very crooked, and grain more winding than in any other species.

Juglans rupestris, Engelm. — Common in cañons and valleys along and near the Gila, where it grows to rather a larger size than Rothrock's description credits it with. Near Mangus Springs there are two large specimens, one having a trunk not far from 1½ feet in diameter. The wood is as valuable as that of *J. nigra*, and the small nuts are rich and sweet.

H. H. Rusby

Ophioglossum vulgatum.—This fern has not yet been credited to the Pacific coast, though its presence here has been suspected. Mr. and Mrs. Lemmon collected it last year in Arizona. In February, 1850, Dr. C. C. Parry collected it at San Diego, but he obtained only a few specimens, which were lost while en route to New York.

To-day, Dr. Parry and I rediscovered this plant growing upon the high mesa, near the public school building. We collected it in many places, widely separated. We found it with *Dodecatheon Meadia* (var.), *Saxifraga Parryi*, a small form of *Selaginella rupestris*, and a liverwort. It grows in grassy, and often stony spots, which are not specially wet; indeed, some of them are quite dry. During a large portion of the year the soil in which this fern grows is dry and hard.

No doubt, if botanists will go down upon their knees, a little close observation will result in the finding of this fern at other points in this State, and perhaps in Oregon.

San Diego, California, March 7th, 1882. D. Cleveland.

Hybrid Oaks.—When I settled here some thirty years ago, I found on the grounds of a Germantown gentleman, Jeremiah Hacker, a bearing tree of the European *Quercus Robur*. I have since raised hundreds of young acorns from this isolated tree. These have borne, and young trees from these have had acorns. I have two generations of fruiting trees from this single one. I can say from this experience that like usually begets like, but here and there remarkable leaps occur. Now, it may be, a tree has leaves wholly sessile, another may have leaves with petioles a quarter of an inch long. I have had instances of trees with leaves as nearly entire as those of a chestnut oak, while others would have them so deeply lobed as to be fairly pinnatifid. And the acorns vary. Some are very little longer than broad, while others are double the length, and form perfect cylinders. How or why these strange leaps occur I could never satisfy my mind. That they are not due to hybridization is certain. That it must be owing to some innate power to change, is equally clear, whatever the nature of that power may be. An interesting fact in connection with these occasional great leaps from the common form is that the change, once secured, is almost as hereditary as are the features of the parent form. Here and there, as in this parent, there will be a sudden departure, many often in the direction of the original, though not always so. I could give many illustrations from other trees, as well as from this one English oak.

The conclusion that I have been forced to is that the odd forms we often find in nature are not necessarily hybrids, but are as likely, if not more likely to be the outgrowth of some internal law of form with which we are as yet unacquainted. That they do not often perpetuate themselves is remarkable when we remember that of thousands of seeds produced on any one tree, but a very small percentage ever gets a chance to form, and of those which do sprout, again but a small percentage survives to become bearing trees. As the number of trees reproducing the general features of the original may be as a hundred to one of the more strikingly aberrant forms, we may see that though individual instances may be common, we are never likely to meet many trees of one stamp. Once in a while an individual tree may find itself in a situation favorable to the preservation of a number of seedlings, which might endure till again reproductive; and in such cases a marked variety may originate and make its way over the earth.

I have often thought it probable that in time a few individuals of these suddenly introduced forms might again leap into new features, and then if they should be able to sustain themselves, we should have new species quite independently of any principle of natural selection; that principle, as I understand it, being governed chiefly by "environment."

Germantown, Pa. THOMAS MEEHAN.

Eleocharis nodulosa, Schultes, Nees (*E. consanguinea*, Kunth., En. Pl. ii, 148.)—This *Eleocharis* was collected by Mr. C. G. Pringle in Arizona last summer. It is a South American species "not before known to be a native of the United States." This is but one of the numerous and interesting additions to our flora made by Mr. Pringle during his collecting tour in Arizona and California last season. In his sets of Pacific Slope Plants it is ticketed "*Eleocharis.*—By streams of the Santa Catalina Mountains, June 27."

Thanks are due Mr. Wm. Boott, of Boston, for the proper determination of the species.

The following description is drawn from Pringle's specimens:

Culms about 20 inches high, terete, knotted with approximate transverse septa, densely tufted from a creeping rootstock, sheathed at the base, leafless. Spike ovate-lanceolate, about three-fourths of an inch long, pointed; scales closely imbricate, oblong or oblong-lanceolate, obtuse, 1-nerved, membranous, with a broad hyaline tip and margin. Achenium obovate-pear-shaped lenticular, minutely striate with punctate dots, and also very slightly transversely wrinkled, brownish-olive, crowned with a flattened, conical tubercle. Bristles 4–7, about the length of the achenium, downwardly barbed stamens, two or more, usually one.

F. LAMSON SCRIBNER.

Notes from Massachusetts.—In his teratological notes in the January BULLETIN, Mr. Trimble mentions *Cirsium lanceolatum*, Scop., with pure white flowers. I also noted a whole colony of the same extending some distance along a roadside in Hadley, Mass., last summer. The soil was a stiff clay, parched and cracked with drought. It would be interesting to note if these conditions produced the form, and if it would persist the second year.

Erigeron strigosum, Muhl., var. *discoideum*, noted by Robbins in Uxbridge, Mass., I have found in this region.

Lychnis Flos-cuculi, L., seems to be well established in a meadow in this town. Flowering in June, it is so abundant as to give the whole field of several acres a bright pink tint.

Quercus palustris, Du Roi, is quite common in this locality, and, in every specimen that I have examined, the acorns are marked with longitudinal stripes of bright orange-color. I find no mention of this in Gray, or in Emerson's Trees of Massachusetts or in Michaux's Sylva, and am at a loss to explain it. If it is a characteristic of the type it would seem of sufficient importance to merit mention. If merely a form it is interesting, and perhaps marks a hybrid between the type and *Q. coccinea*, Wang., var. *tinctoria*. Will some one who knows volunteer an explaination?

Amherst, Mass., March 20th, 1882. W. E. Stone.

Vegetable Fibres in the Oriole's Nest.—A nest of the *Icterus Baltimore* sent me from Westchester, N.Y., by Mr. W. D. Abbott, proves to be made of the fibres of *Asclepias Cornuti*, and lined with tawny wool from the fruit of the buttonwood, *Platanus occidentalis*. The liber-cells of the *Asclepias* are ¾ of an inch long, very slender, and pointed at both ends. If the bark could be gathered in sufficient quantity it would make a very fine, soft, silky and tough paper, unlike any now made in the country.

D. C. Eaton.

Note on Alder Catkins.—I find, upon careful examination in my usual haunts about this city, that the *male* catkins of the alders seem to have very generally failed this year. It might be well to observe whether this is so elsewhere. Can any one guess the cause? In many years of herborizing I never knew them scarce before. Now it is difficult to find any, and the few detected are stunted and poor.

Providence, R. I. W. W. Bailey.

Botanical Literature.

A Synopsis of the North American Lichens: Part I., comprising the Parmeliacei, Cladoniei and Coenogoniei. By Edward Tuckerman, A.M. Boston, S. E. Cassino, 1882.

The long-felt want of a guide to the North American Lichens is at last supplied, and in a manner which leaves nothing to be desired. It is now thirty-four years since the first Synopsis by the learned author was published; and that, though it gave the best descriptions of our lichens in the language, had become to a large extent obsolete through the advance in knowledge both of the anatomy and of the species of these most difficult plants; and the difficulties in the way of ordinary students in their study were almost insurmountable. The microscope, which, in 1848, had hardly been applied to lichens, has revealed new wonders and rendered necessary modifications of the system then adopted, though this in its basis is not substantially changed. The Genera Lichenum of the author presented these modifications in a very able and learned manner, and in the present work we have its application in the study of our species. In mechanical appearance the book is a worthy companion to the Genera, one of the best printed botanical works ever issued in this country, and it is only to be regretted that some errors of the press have escaped correction.

The descriptive portion of the work is preceded by an introduction giving a concise account of the outlines of lichen structure, in which there is yet noticeable a certain reserve, and a gratifying absence of dogmatism on a subject in which there are still so many disputed points, and where so much yet remains to be studied. The question of the autonomy of lichens is considered to have been settled by the researches of Dr. Minks, whose remarkable investigations into the intimate structure of these plants should be better known. Following the introduction is a list of the most important works on the subject.

Of the systematic and descriptive portion we can only speak in the highest terms. The system of the Genera, based on that of Elias Fries, is followed with slight modifications. The subdivisions and groupings of the genera are admirably calculated to lead the student to finding the proper place of a plant under observation. The diagnoses of species are in every way admirable ; clear and concise, neither deficient nor redundant, the best we are acquainted with in any language, they will enable any student with the aid of a microscope of moderate power (say from 350 to 600 diameters) to determine any of our lichens, so far as possible (for the most experienced lichenists often find it difficult to do this) without an authentic specimen before him for comparison. In such studies as those of Dr. Minks, however, a much higher power is required.

The key to our author's method is to be found in his remark that "the interest of the study of lichens lies in the resolution rather than the over-estimation of difficulties;" hence we find him ever aiming at a comprehensive and philosophical view. Those who look for a multiplication of species and varieties will not find it here ; but, instead, an admirable grouping of related forms in which the sub-species of the author are in most cases the species of other writers, with whom, as has been observed to us, "every remarkable species becomes a genus, and every remarkable variety a species." What shall constitute a "species" in lichens is so much a matter of opinion that the method of this book is in every way preferable. In a full "Lichenographia" more attention would be given to minor differences, and to points of structure ; but for inexperienced students, such as are most of us in this country, this Synopsis is a far better guide. The prominence given to habit is another excellent feature not to be lost sight of, and we approve of the absence of all reference to the uncertain chemical tests on which so much reliance is placed by European lichenists. The book must be the standard and guide of American students in the future, and it is to be hoped that it will not be long before the second and final part is given to the public.—H. W.

The Names of Herbes. By William Turner (A. D., 1548). Edited (with an Introduction, an Index of English Names, and an Identification of the Plants enumerated by Turner) by James Britten, F. L. S., of the British Museum. Trübner & Co., London, 1881.

"Thys litle boke," says the quaint old author (writing in 1548) "cōteineth the names of the moste parte of herbes, that all auncient authours write of both in Greeke, Lattin, Englishe, Duche and Frenche, I haue set to also the names which be cōmonly vsed of the poticaries and cōmon herbaries. I haue tolde also the degrees of so many herbes as Galene the chiefe Doctour of al phisicians hath written of, and because men should not thynke that I write of it that I never sawe, and that Poticaries shoulde be excuselesse when as the ryghte herbes are required of thē, I haue shewed in what places of Englande, Germany, & Italy the herbes growe, and maye be had for laboure and money, whereof I declare and teache the names in thys present treates."

This extract from the author's preface sufficiently indicates the scope of a work which, now very rare and costly, is at length made accessible to all botanists through this reprint by the English Dialect Society, and rendered, by the labors of an accomplished editor, of more *practical* value than the original edition.

Mr. Britten has divided the work into three parts. The first is an exact reprint of the original, the only alterations being in the pagination, and of the insertion, at the foot of each page, of the "fautes escaped in the printyng" (which are again found collected on page 90) and of certain errata that Turner had overlooked. The second part consists of an alphabetically-arranged list of the English names given by the author (whether invented by him or in popular use in his time), each name being followed (1) by its modern scientific equivalent, (2) by the Latin heading under which Turner places it, and (3) by the page of the reprint on which it will be found. The third part is an index in which the modern Latin names of the plants are given in alphabetical order, followed by the various English ones by which they are mentioned in the body of the work.

Altogether, the work forms a fitting companion to the "Dictionary of English Plant-Names," of which Mr. Britten is one of the authors. It will certainly find a warm welcome among those who love the study of botany in its widest sense, and the gratitude of all such is due to Mr. Britten for placing it within their reach.

A Manual for the Preservation of the larger Fungi (Hymenomycetes) in their natural Condition, by a new and improved Method; also a new Process for the Preservation of Wild Flowers. By James Lake English. A. B. Davis, Epping, 1882.

In an article on the "Preservation of Pileate Fungi for the Herbarium," printed in one of the numbers of the BULLETIN last year, it was stated that the only person who had successfully solved the problem of preserving the fleshy fungi with the exact form and color that they presented in the living state was Mr. J. English. This gentleman having concluded to make known to the world his method of procedure, has published a small book of directions with the above title. To even hint at the method would be unfair to the author, who is entitled to all the profit that he can derive from the sale of his work; and we can, therefore, only recommend the latter to the favorable consideration of those interested.

Proceedings of the Torrey Club.—The regular meeting of the Club was held at the Herbarium. Columbia College, Tuesday evening, Feb. 14th, with an attendance of nineteen members and one visitor. In the absence of the presiding officers, Dr. O. R. Willis occupied the chair.

Dr. Willis exhibited some fresh specimens of *Opuntia vulgaris* and *O. Rafinesquii*, remarked upon their supposed differences and gave the results of his cultivation of the plants. The conclusions reached were that the two forms were scarcely distinguishable from each other.

Mr. Britton exhibited fibres of the *Bromelia sylvestris*, from Yucatan, and remarked upon their economic value.

Two persons were elected active members, and one a corresponding member of the Club.

The President appointed the following standing committees:

Herbarium and Library Committee: N. L. Britton, P. V. LeRoy, A. Hollick and Miss E. G. Knight.

Finance Committee: Hon. Addison Brown, J. L. Wall and Dr. L. Johnson.

The regular meeting of March 14th was held in the geological lecture-room of Columbia College, the President in the chair and nineteen members and six visitors present.

Mr. Hollick, of the Herbarium Committee, reported on the state of the herbarium, and announced the recent addition of 150 species thereto.

Mr. Britton reported on the state of the library.

Dr. O. R. Willis remarked on the annual growth of rings in exogenous trees.

Prof. Schrenk gave the result of his examination, for the last two or three years, of *Monotropa*, the conclusion reached being that the plant is not parasitic on the roots of the trees under which it grows. Prof. Schrenk's description of the roots of this plant, with their investing mycelioid substance intermingled with spores, agreed precisely with that recently given of the roots of the same species by Dr. F. Kamiensky, in Europe.

Dr. T. F. Allen presented a paper on the "Development of the Cortex in *Chara*," and gave a brief abstract of it.

The President exhibited and remarked upon a number of drawings of fossil plants from the Tertiary deposits of Green River, Wyoming Territory, and also showed a specimen of an undescribed *Lygodium* of very variable form.

Mr. E. S. Miller exhibited specimens of *Viola pedata*, var. *bicolor*, showing a tendency to become concolorous.

Dr. Willis presented to the library a copy of his recently-published "Flora of Westchester County (N. Y.)."

One person was elected an active member, and one name was proposed for corresponding, and two for active membership.

We are pained to announce, just as the BULLETIN is going to press, the death of our colleague, Mr. William H. Leggett, which occurred Tuesday morning, April 11th. A more extended notice will appear hereafter.

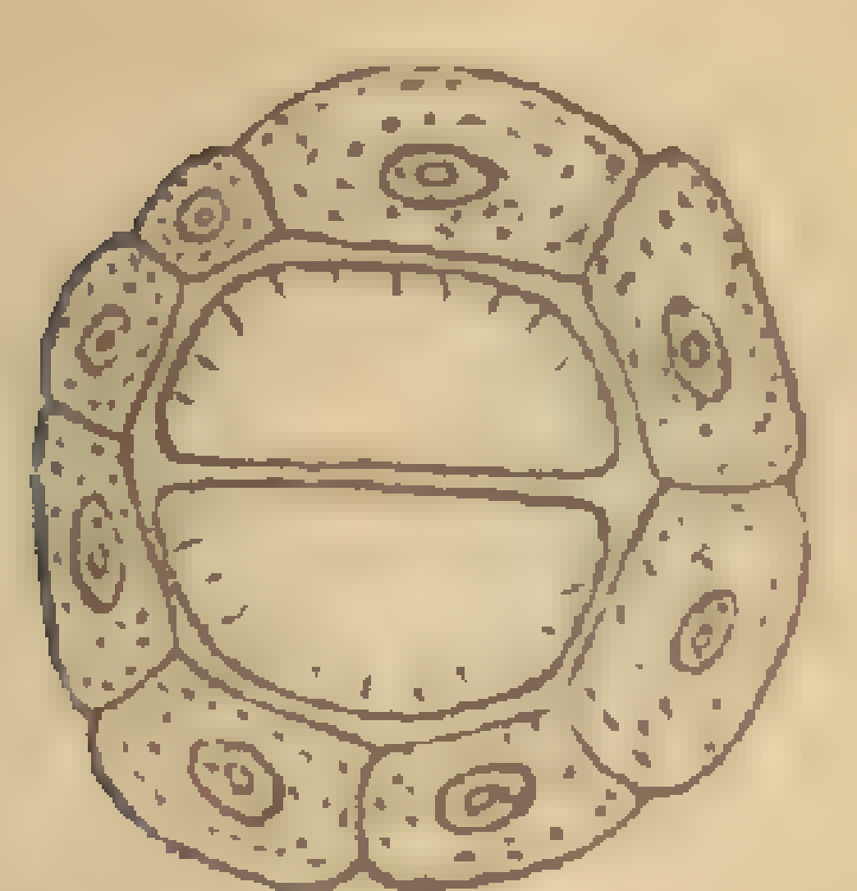


Fig. 1c.

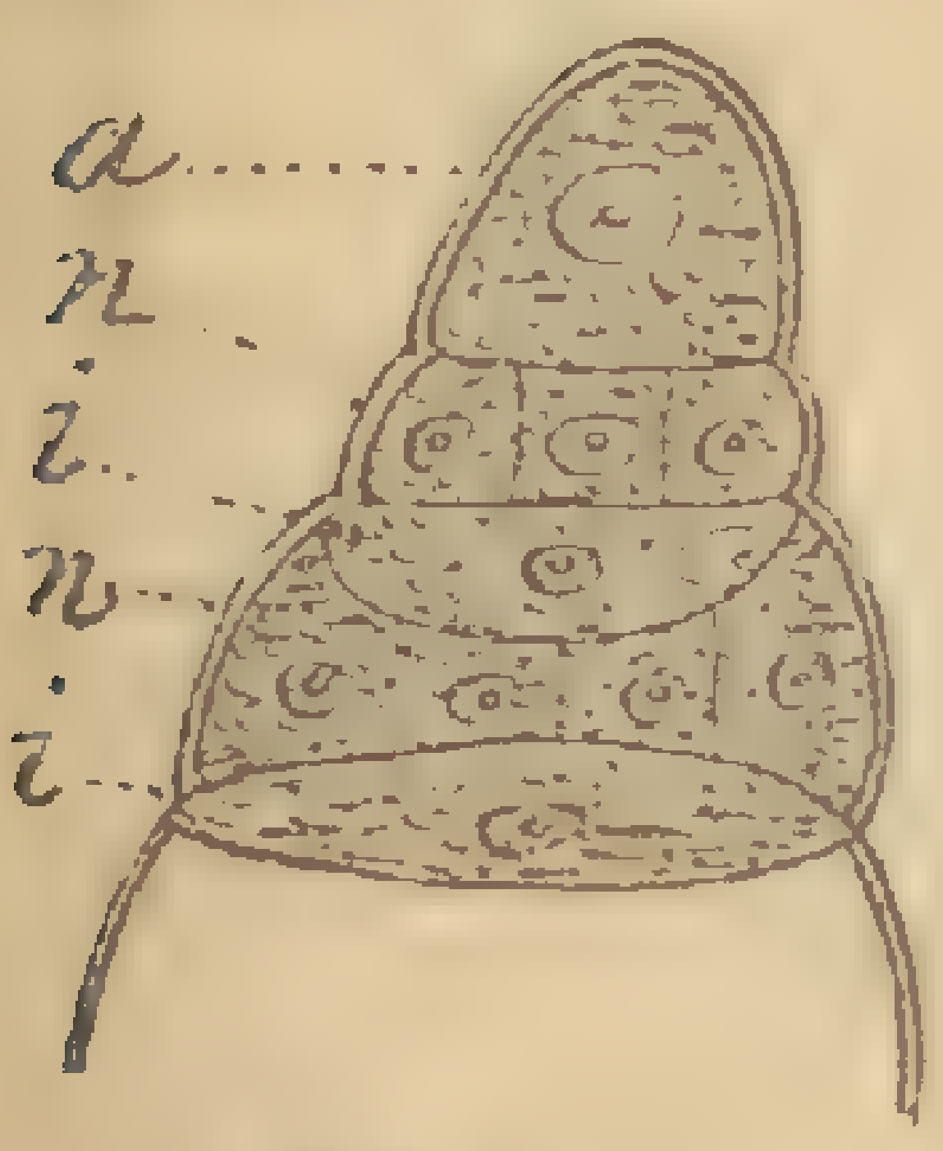


Fig. 1a.

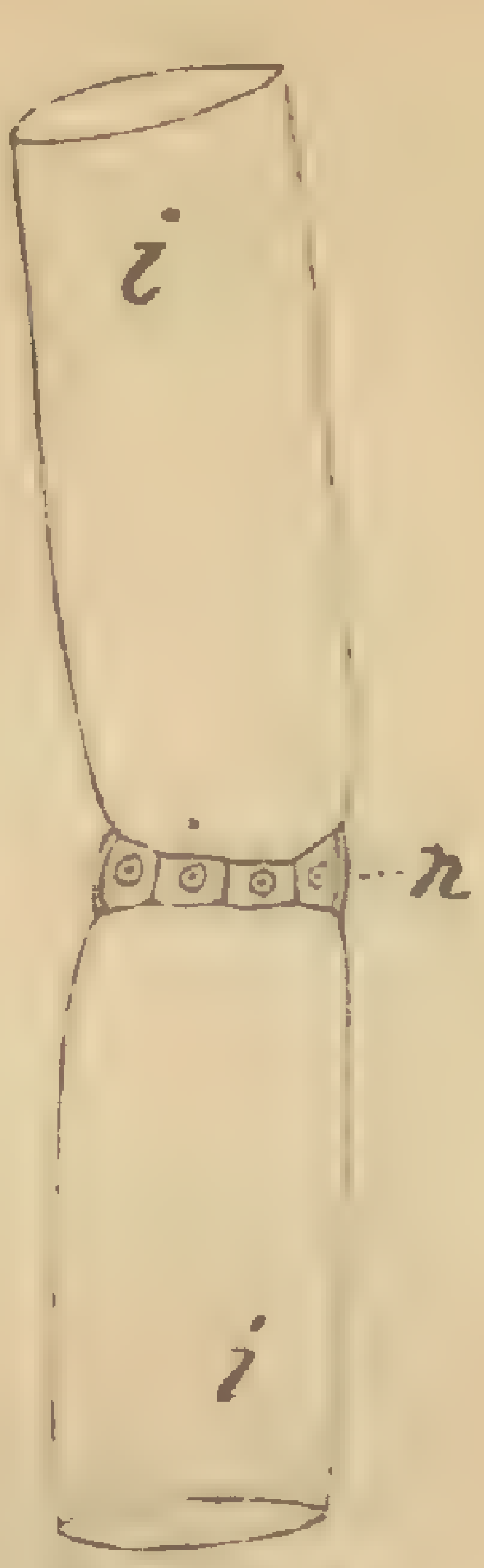


Fig. 1b.

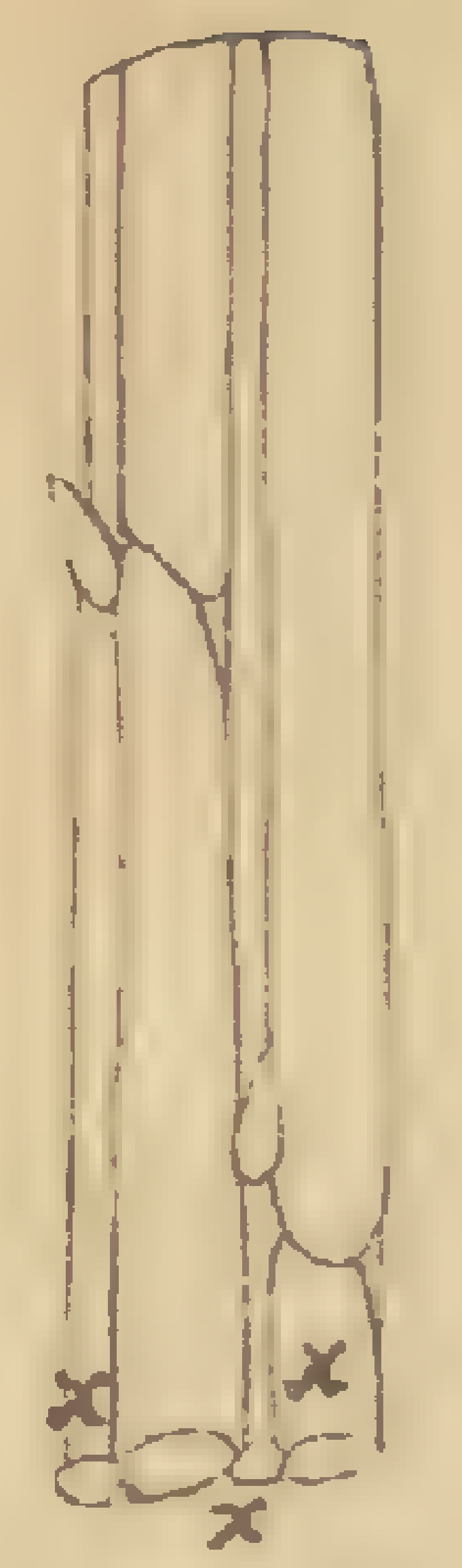


Fig. 6

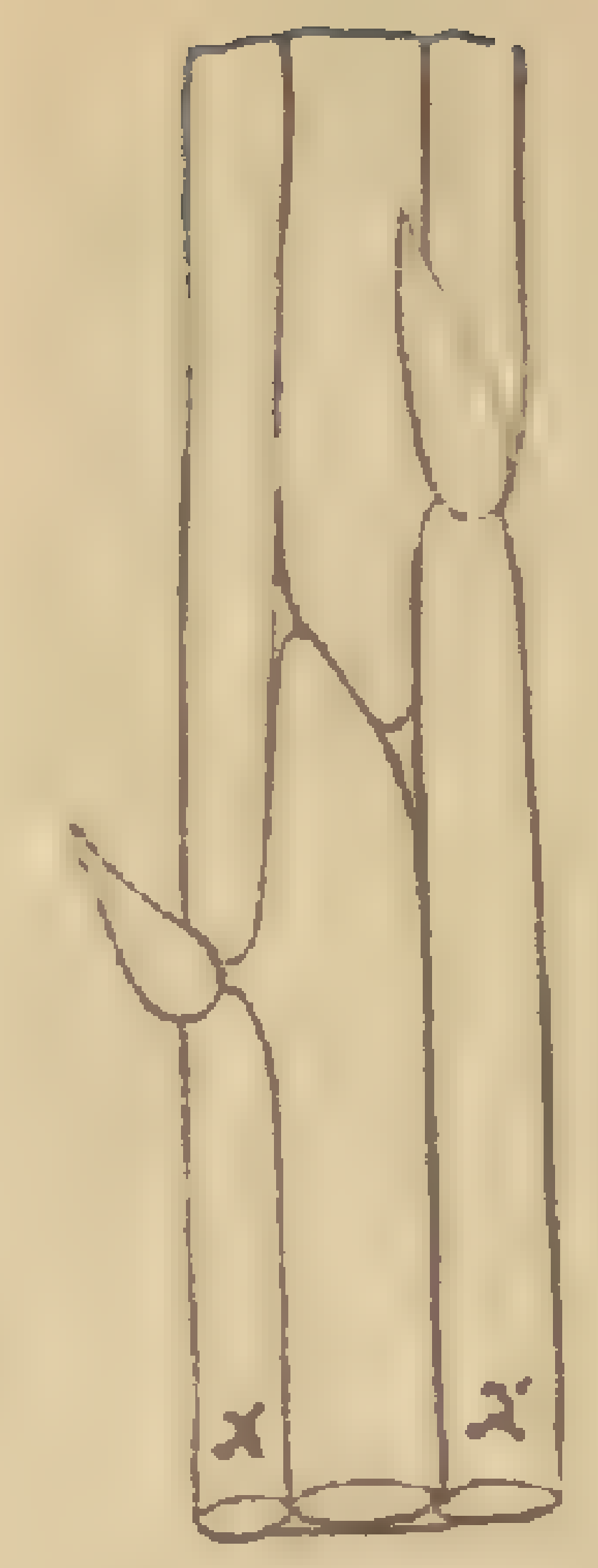
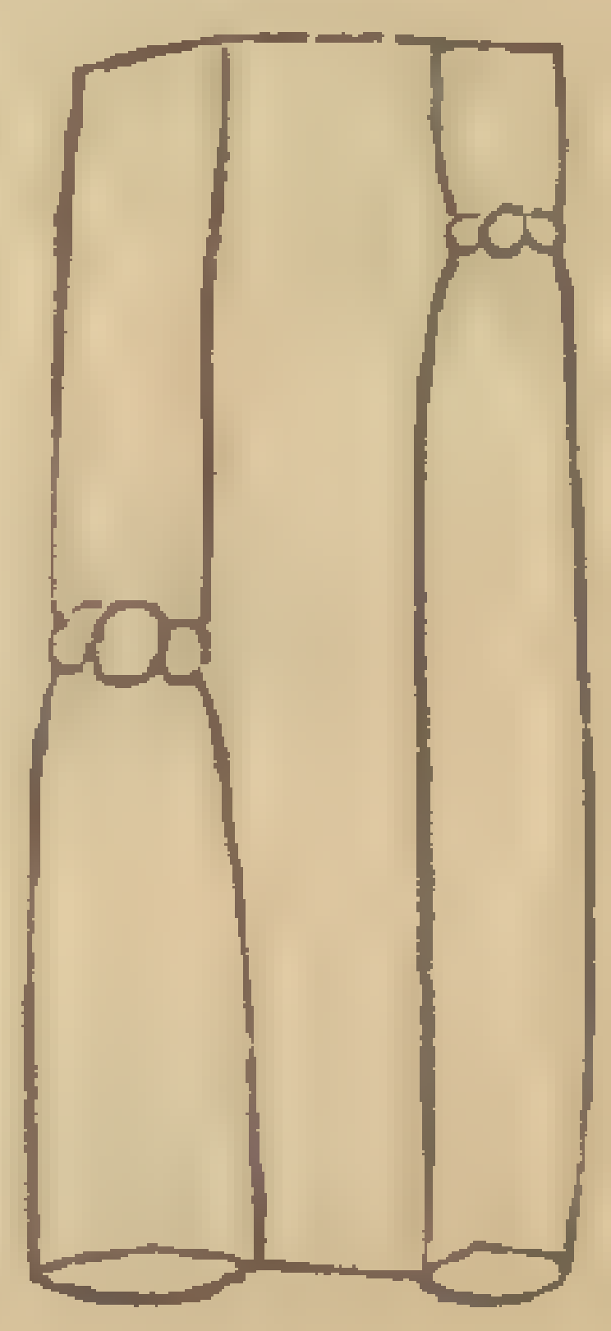


Fig. 7

Fig. 2



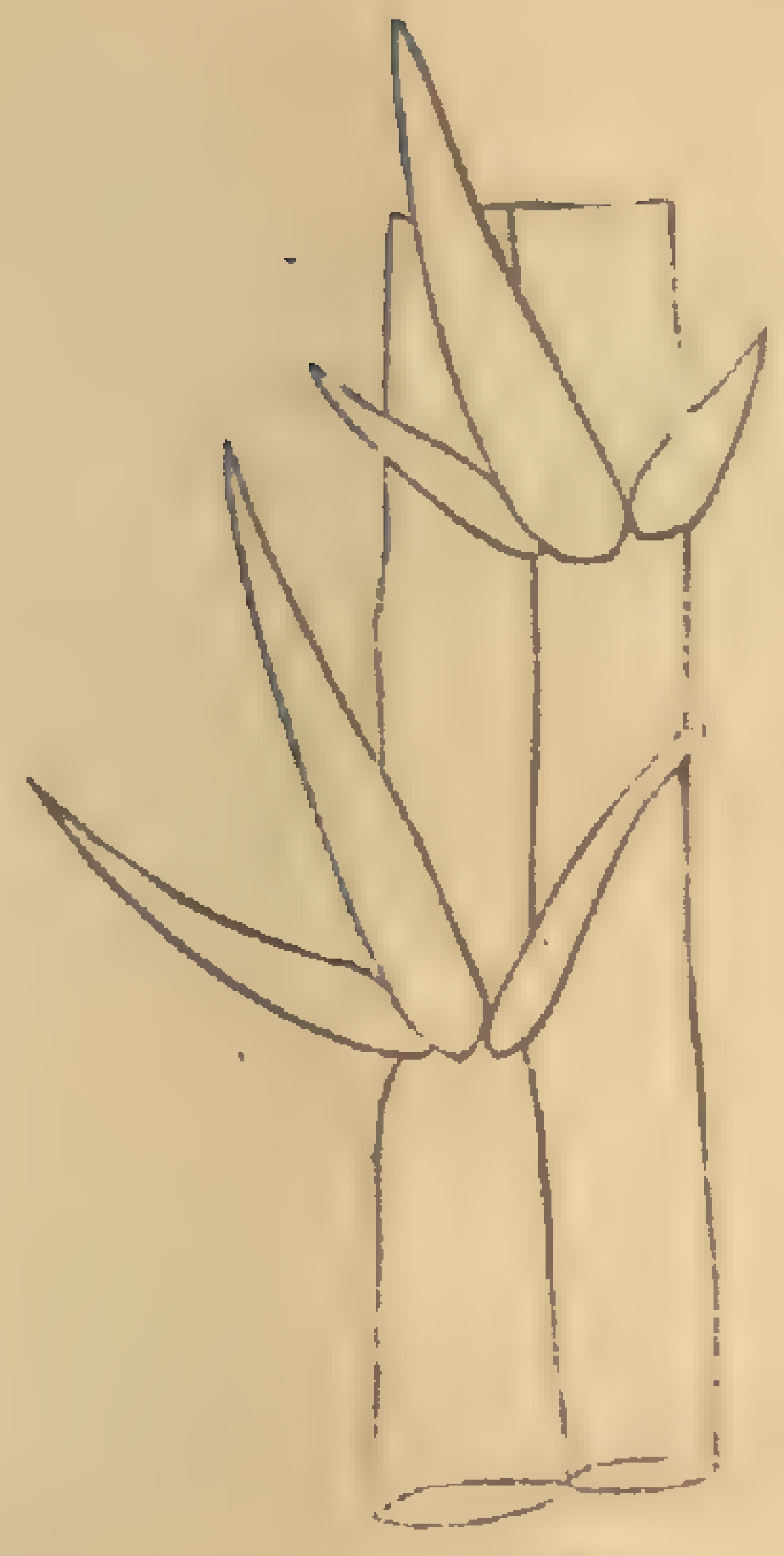


Fig. 3

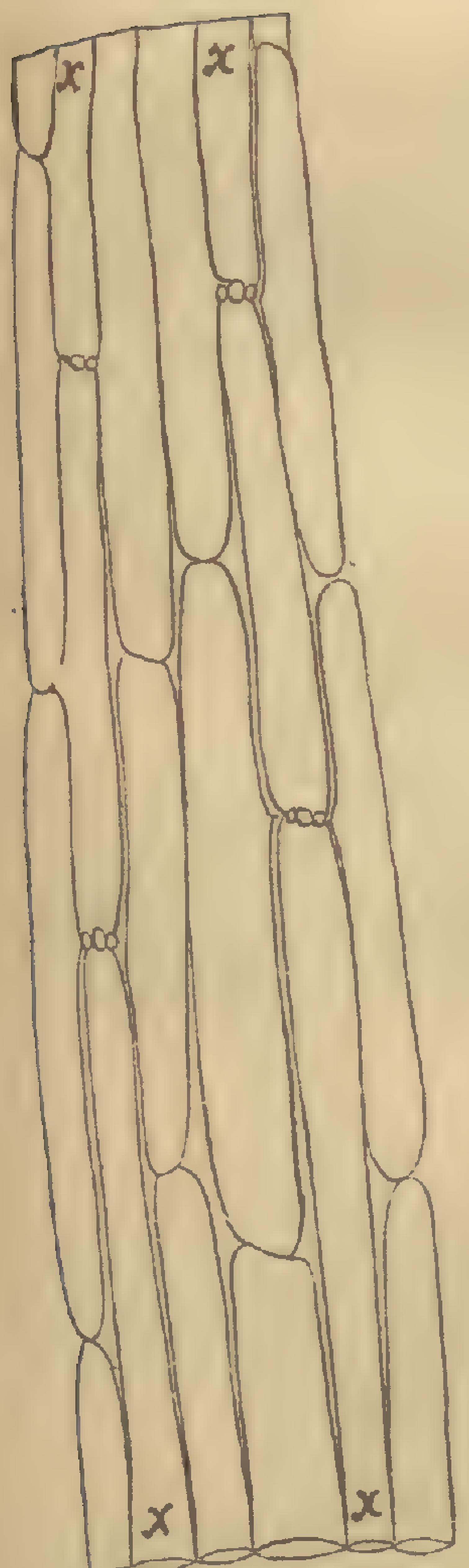


Fig. 8

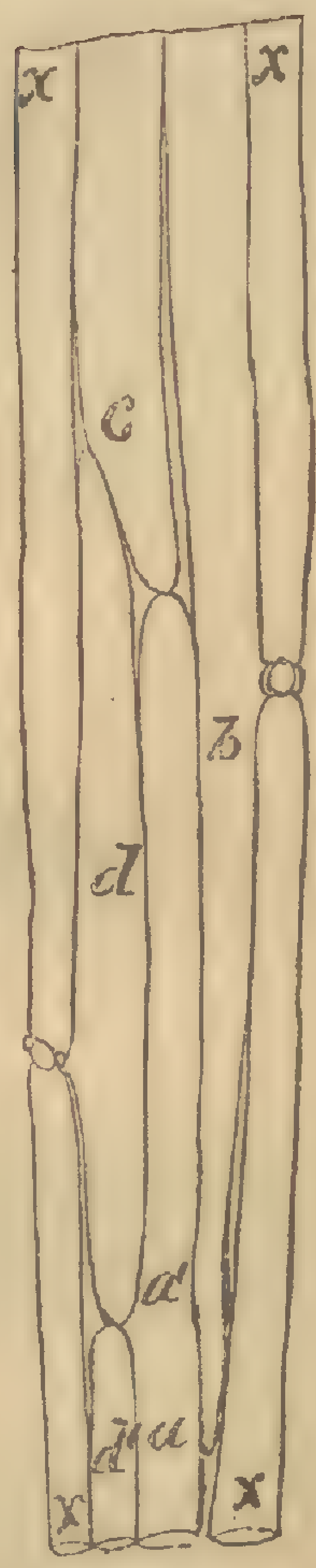

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Fig. 8a.

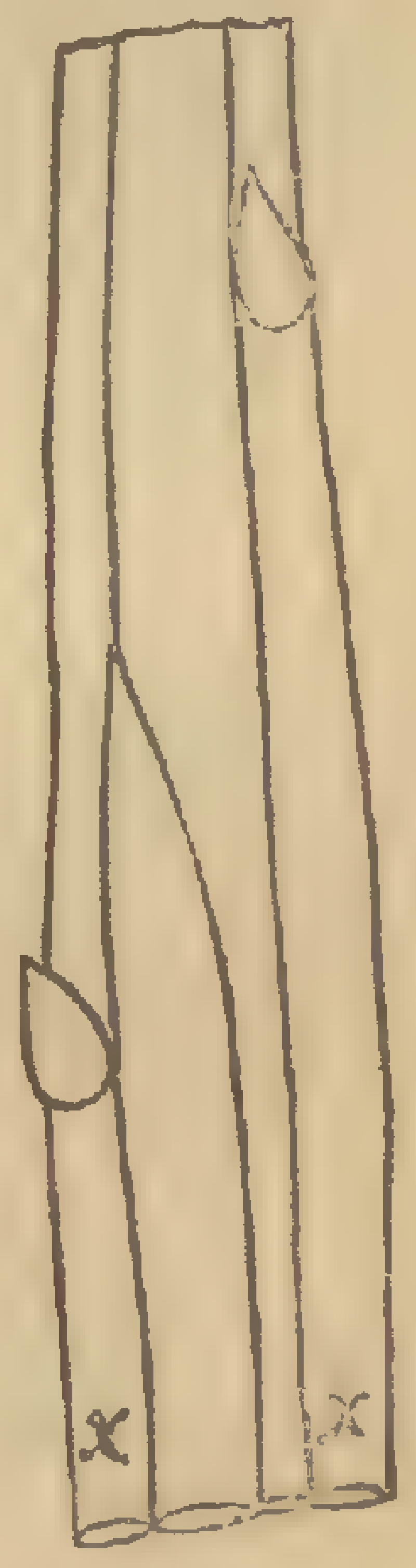


Fig. 7a.

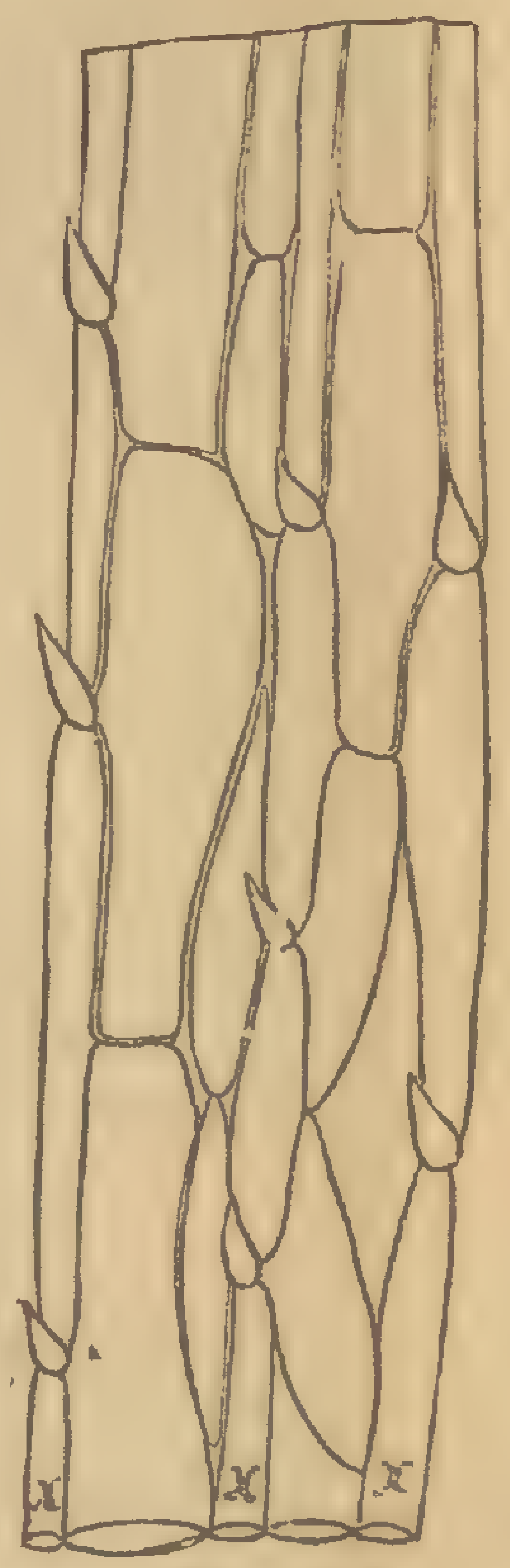


Fig. 7b.

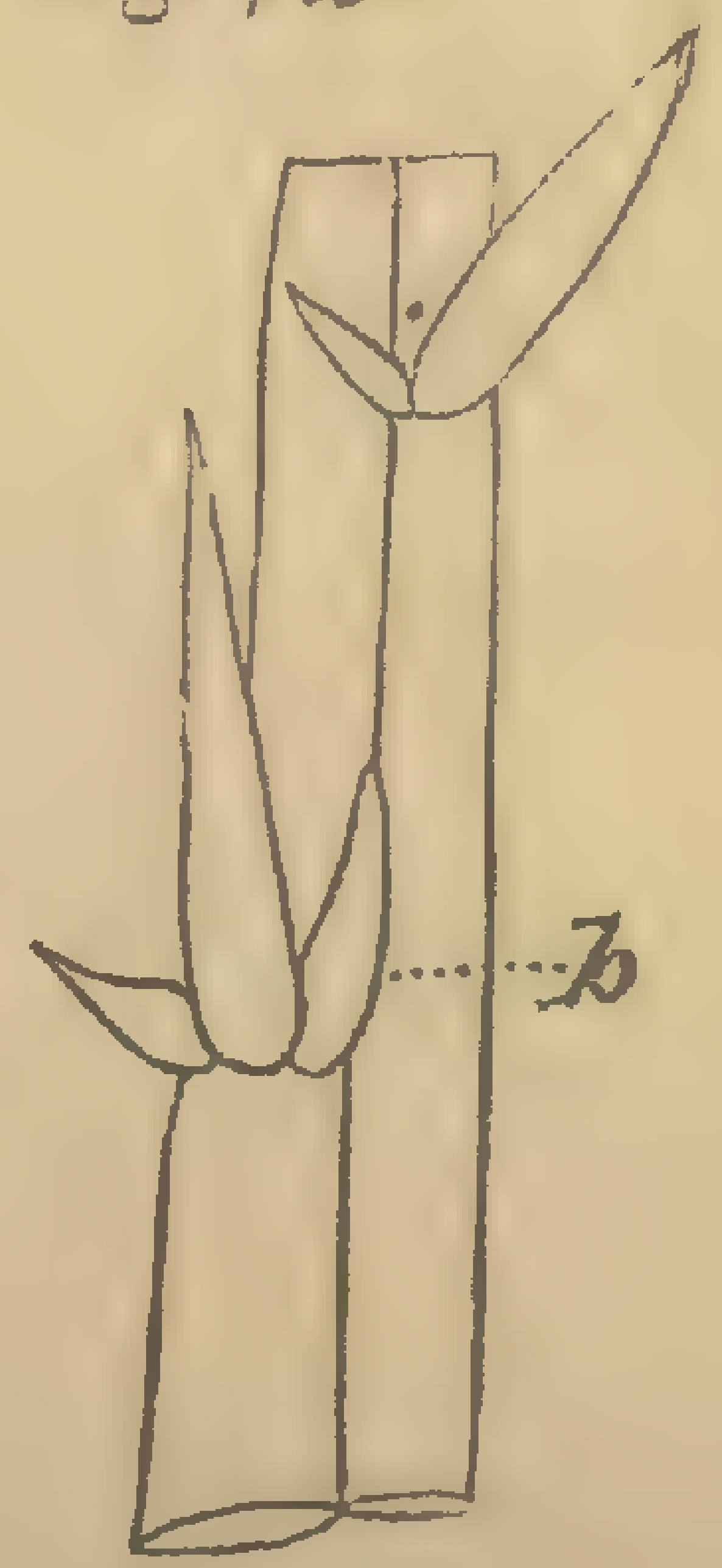


Fig. 4

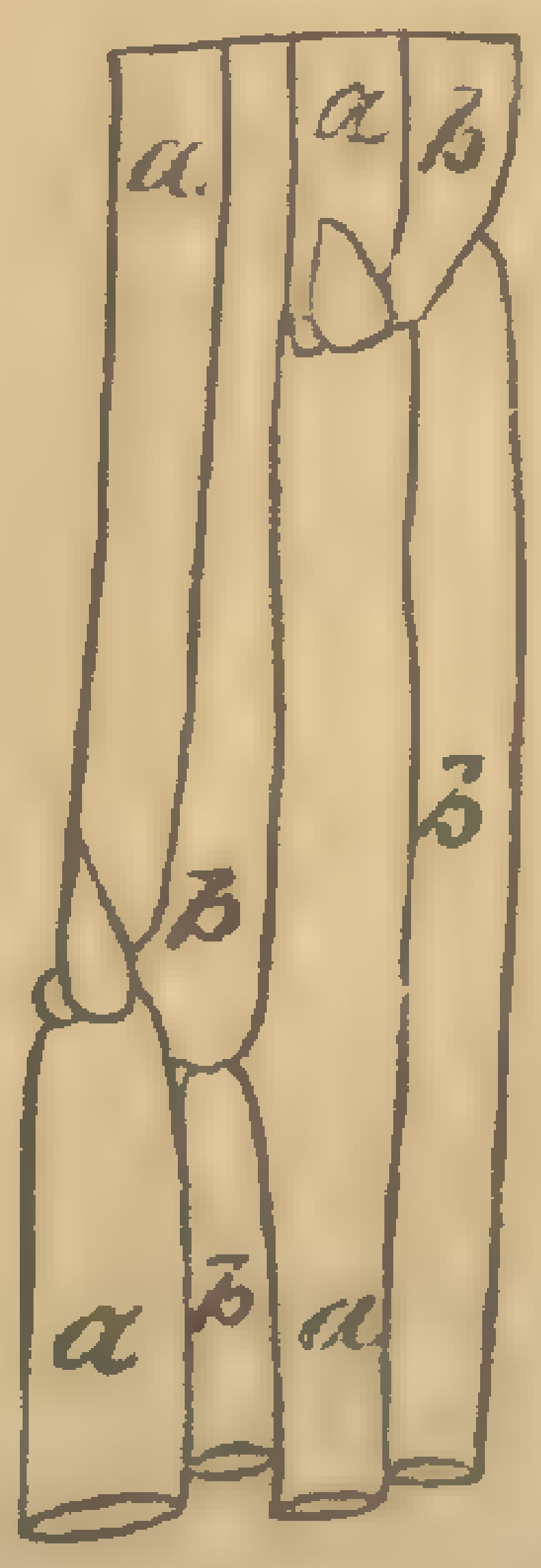


Fig. 5

Development of the Cortex in Chara.

3 × 60
4 × 60
5×60
6 × 60
2 × 60
1 × 30
A
Natural Size

Chara Coronata, Ziz.
Var. gracilis, Allen.

Chara inconnexa, Allen.

Chara crinita. Wallr.

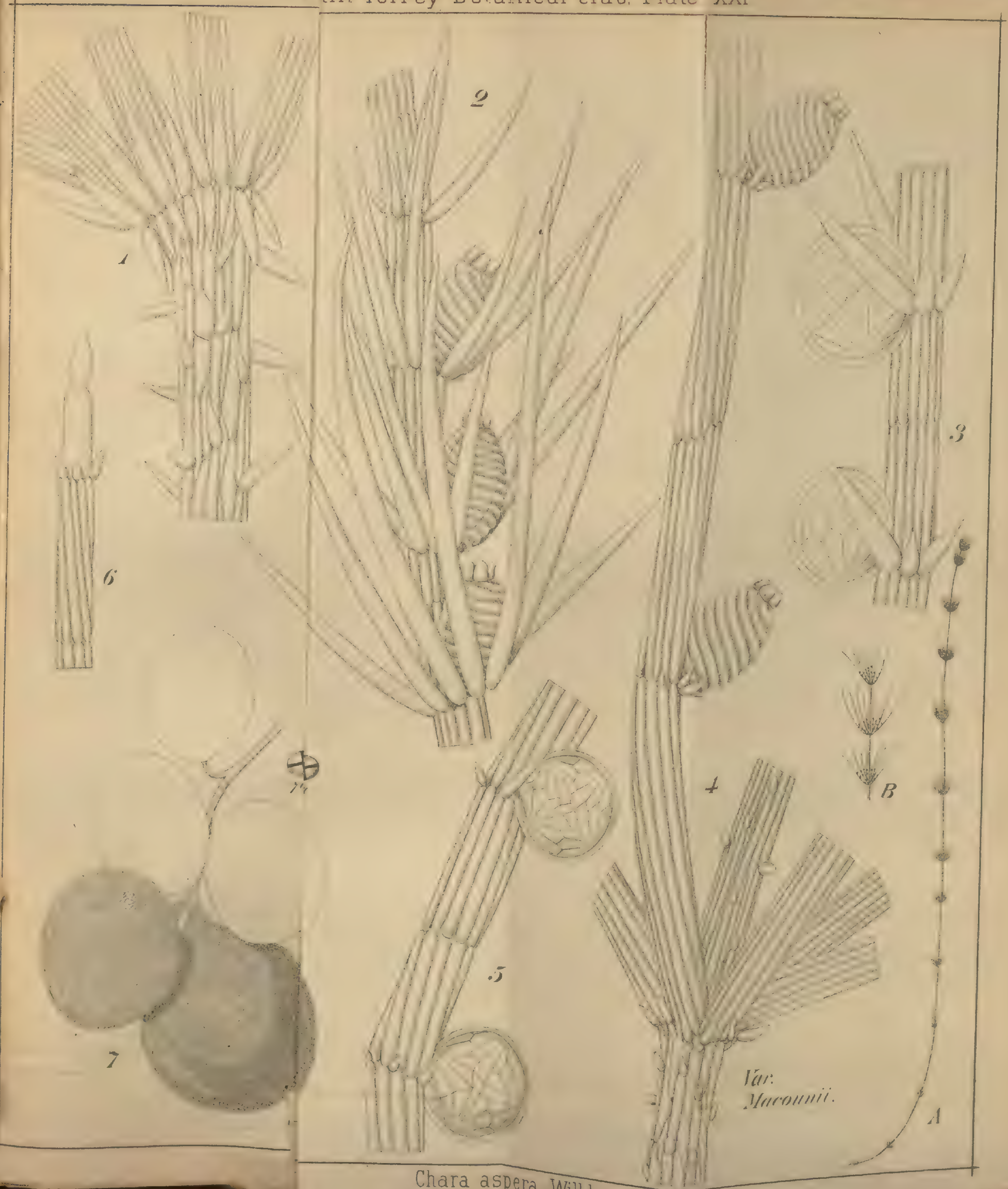
5
a
b
e
c
d
a
b
e
c
d
6
4
3
a
A
B
1
7
a
b
c
2

Chara evoluta, Allen.

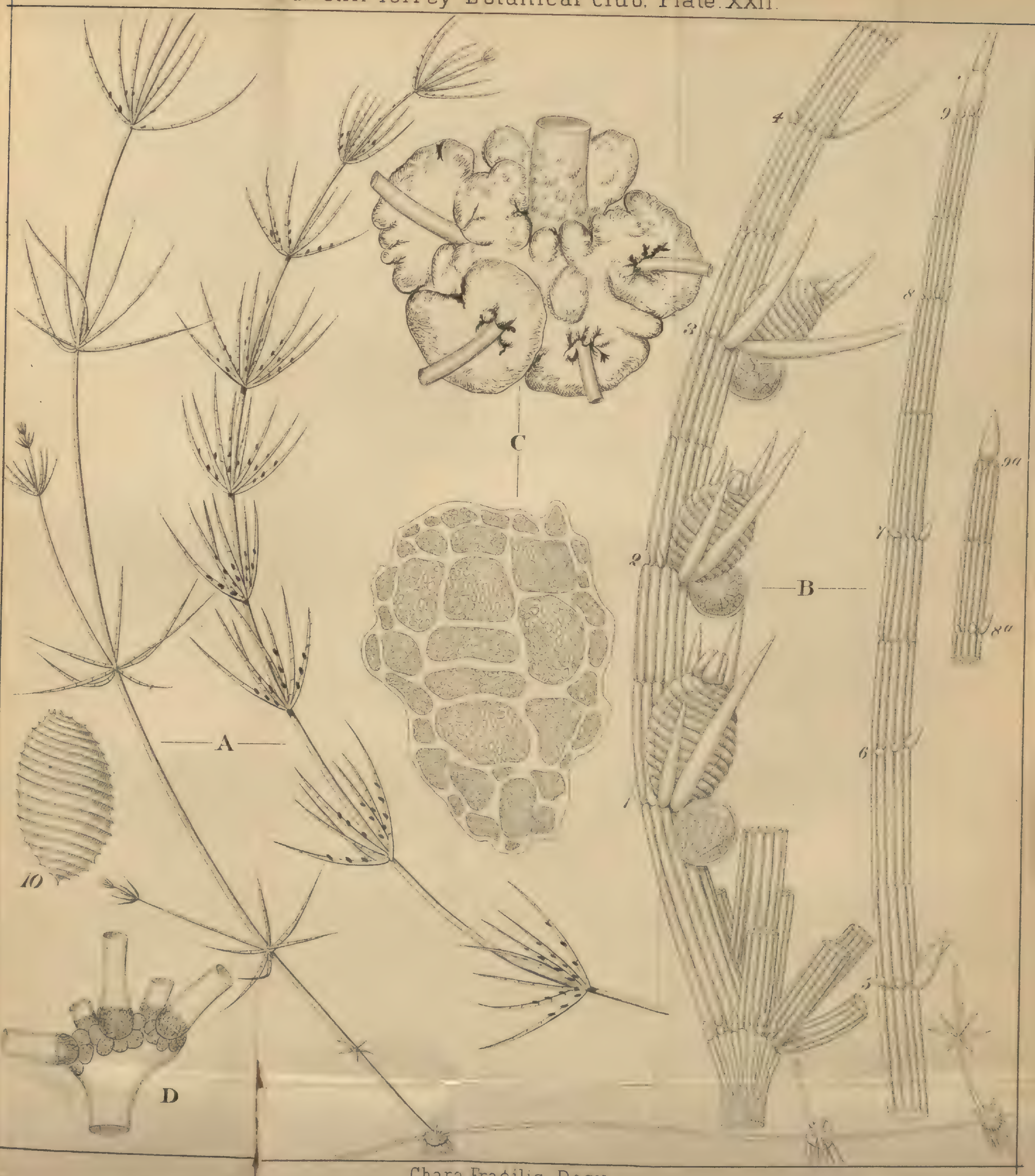
Bulletin Torrey Botanical Club, Plate XX.

Chara excelsa, Allen.

Bull tin Torrey Botanical Club. Plate XXI


2
1
3
6
4
B
7a
5
7
Var.
Macounii.
A

Chara aspera, Willd.


A
B
C
D
1
2
3
4
5
6
7
8
9
8a
9a
10

Chara Fragilis, Desv.

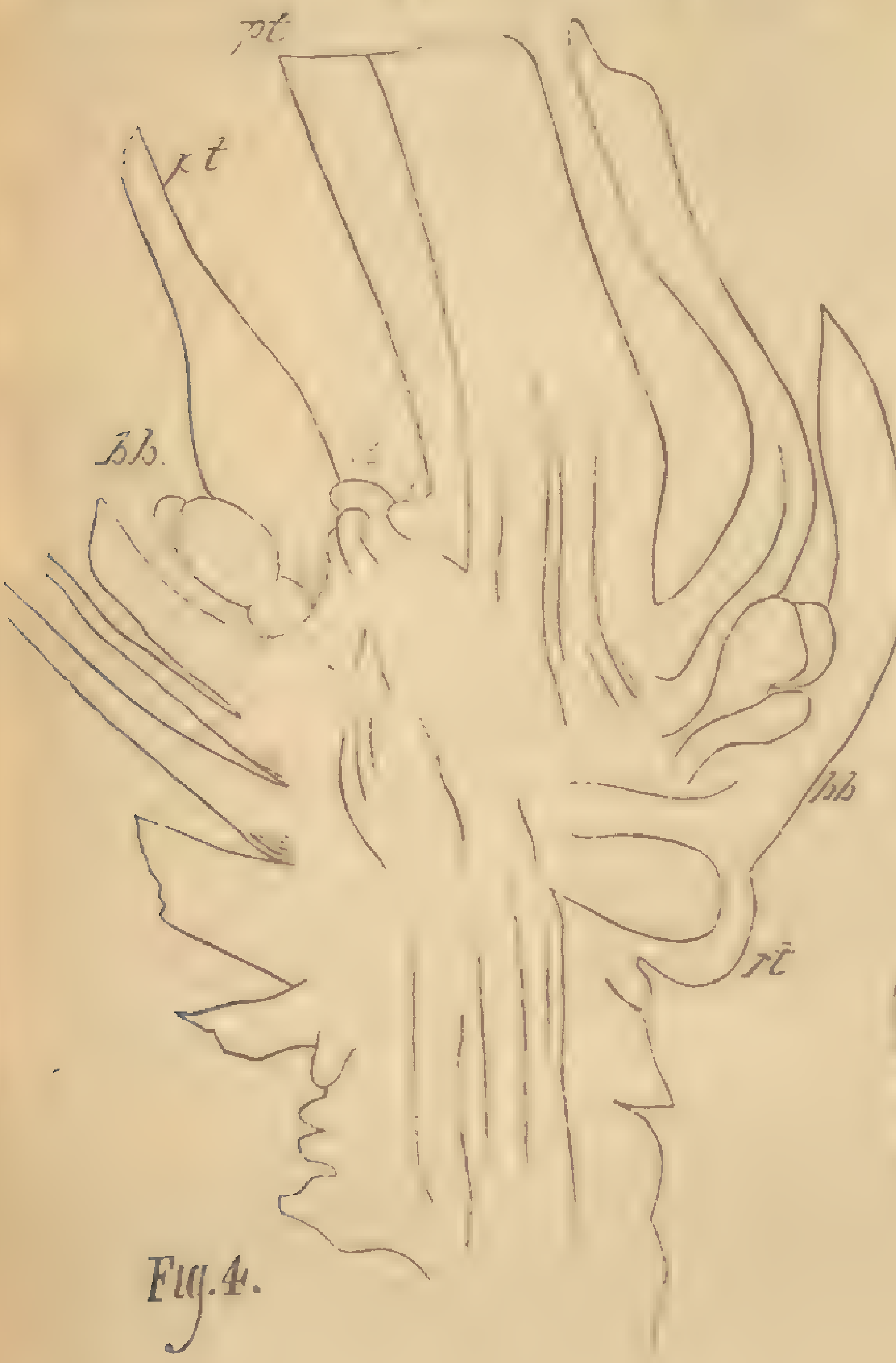


Fig. 4.

pt
rt
bb.
bb
rt

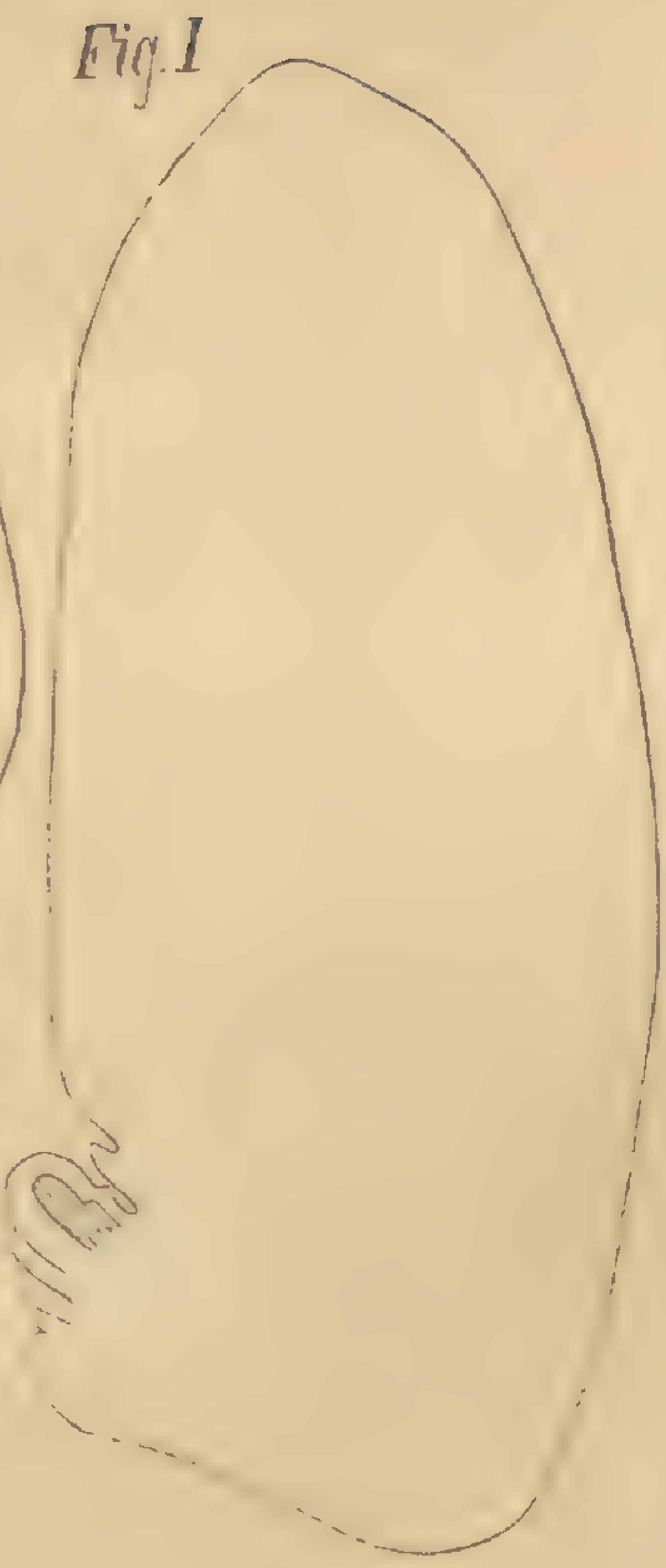


Fig. 1

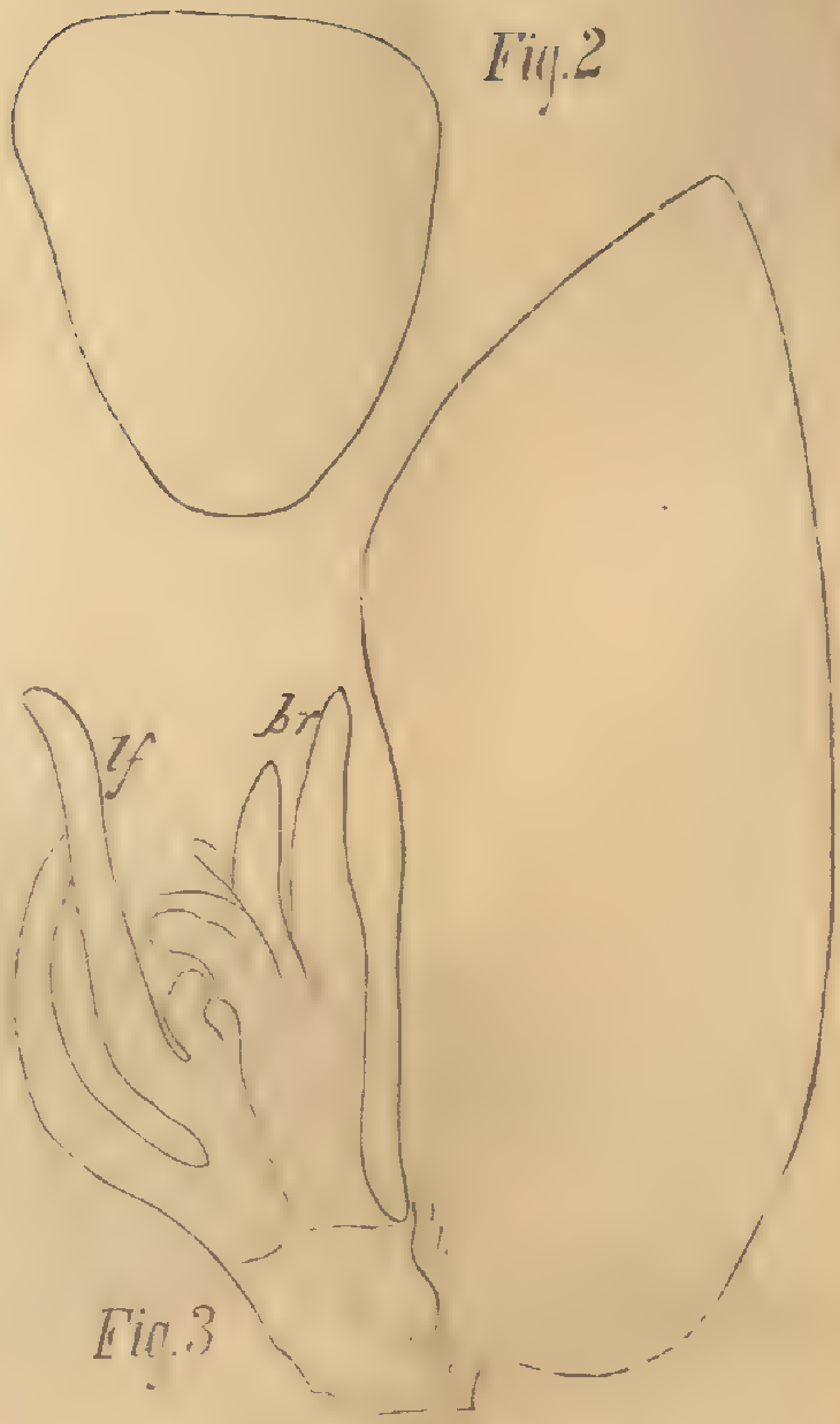


Fig. 2

Fig. 3

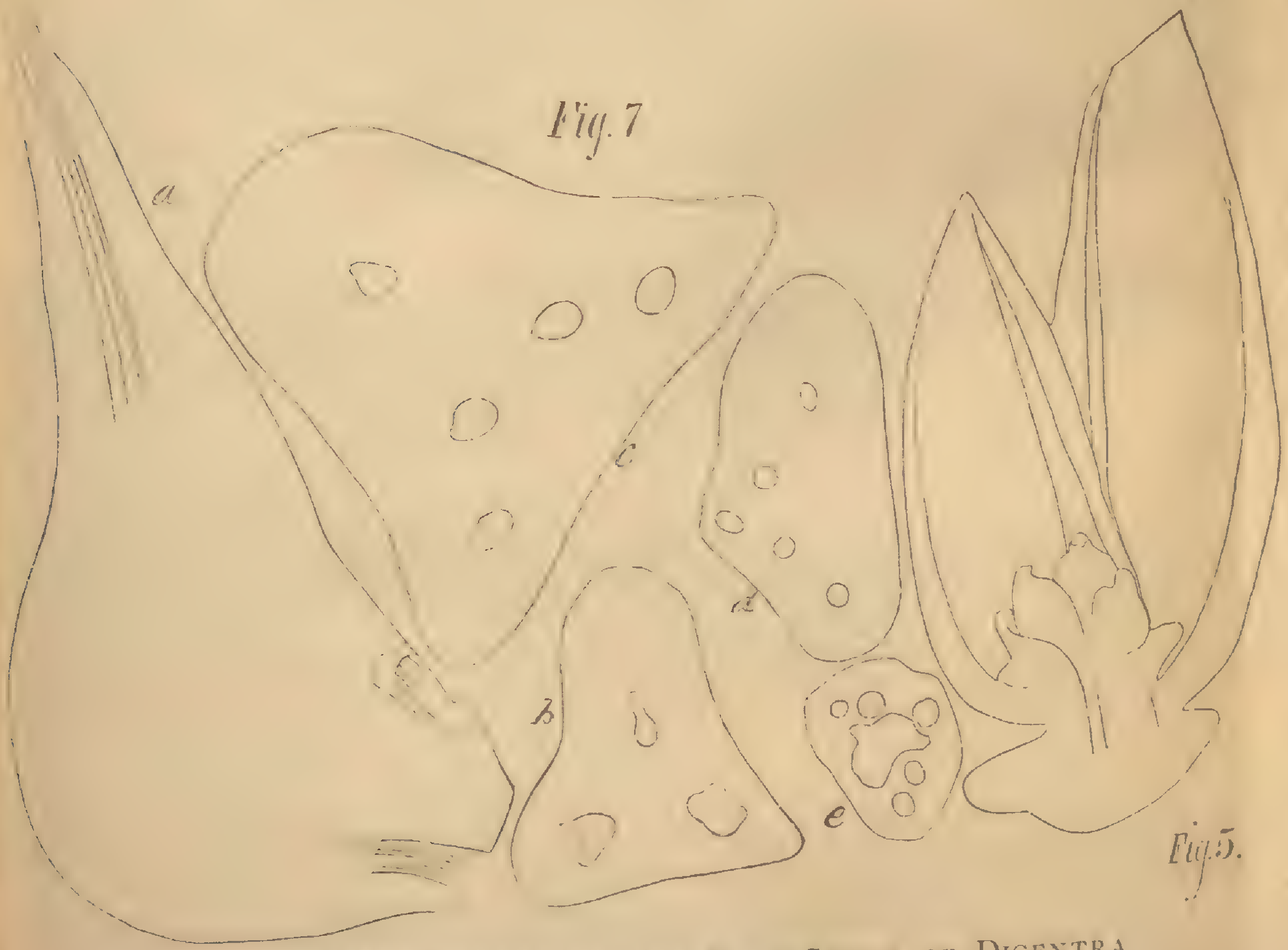
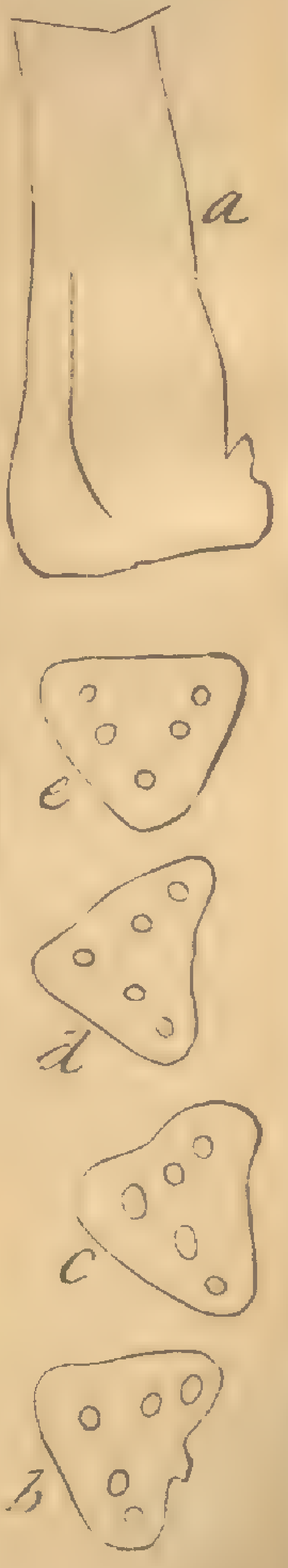


Fig. 7

Fig. 5.



Development of the Root-Stock of Dicentra.

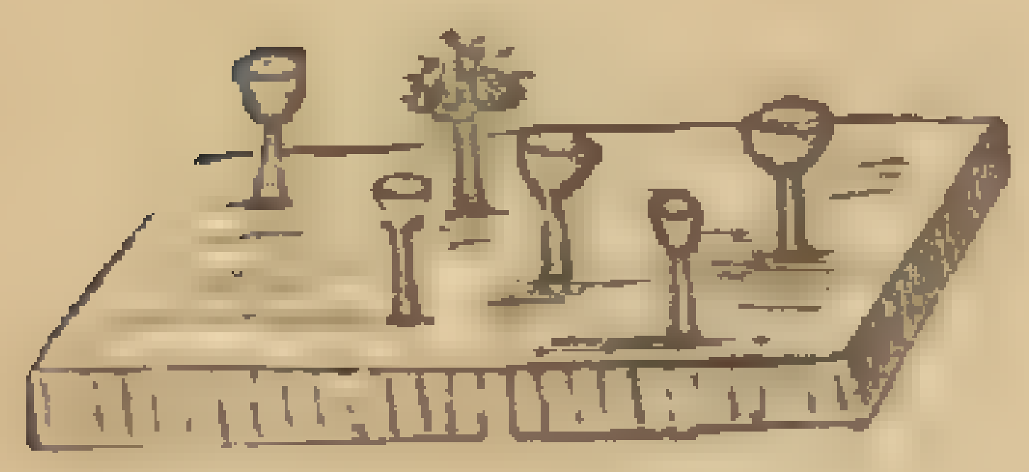


Fig. 1.

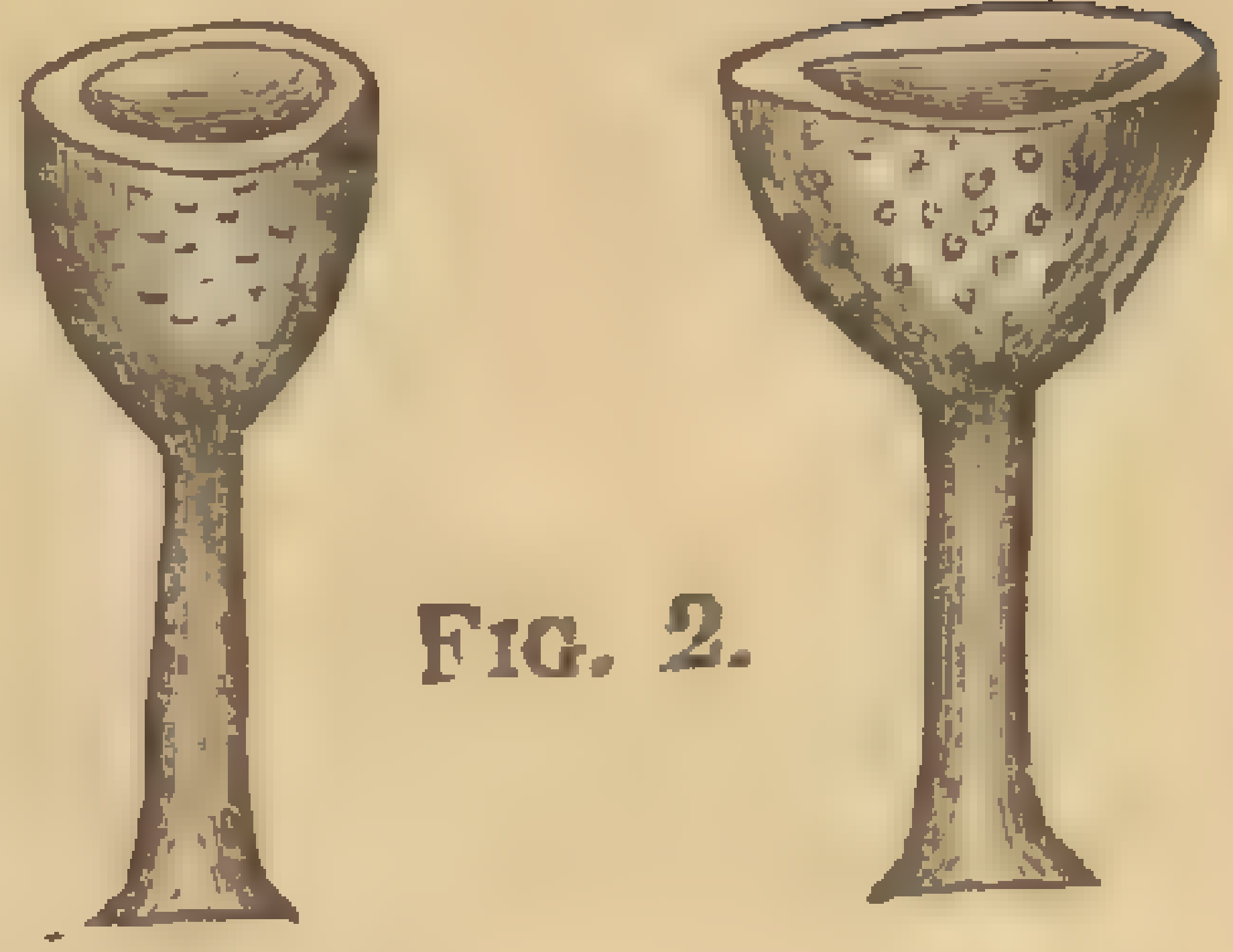


Fig. 2.

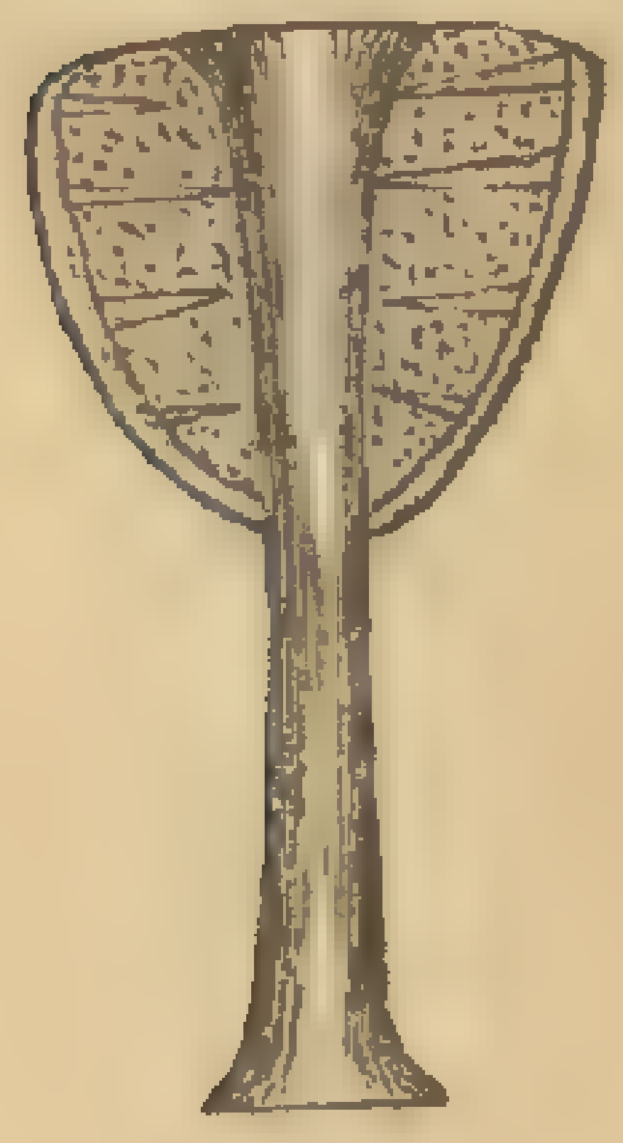


Fig. 3.

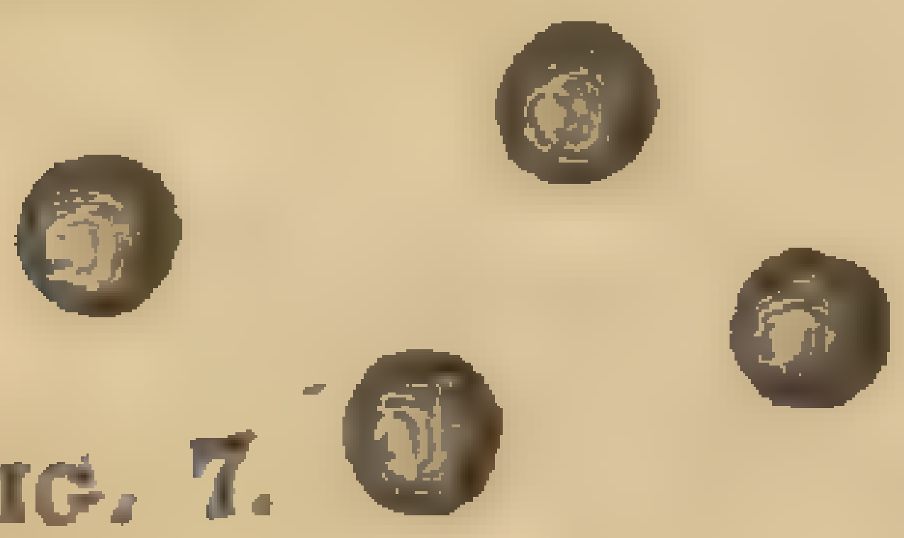


Fig. 7.

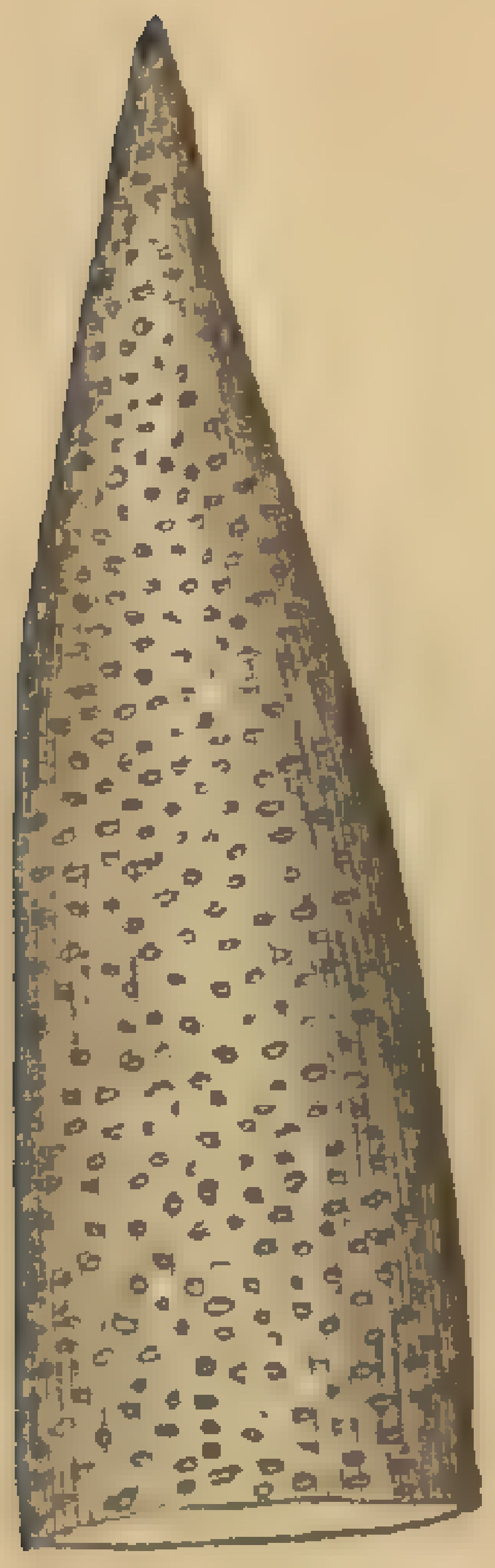


Fig. 6.

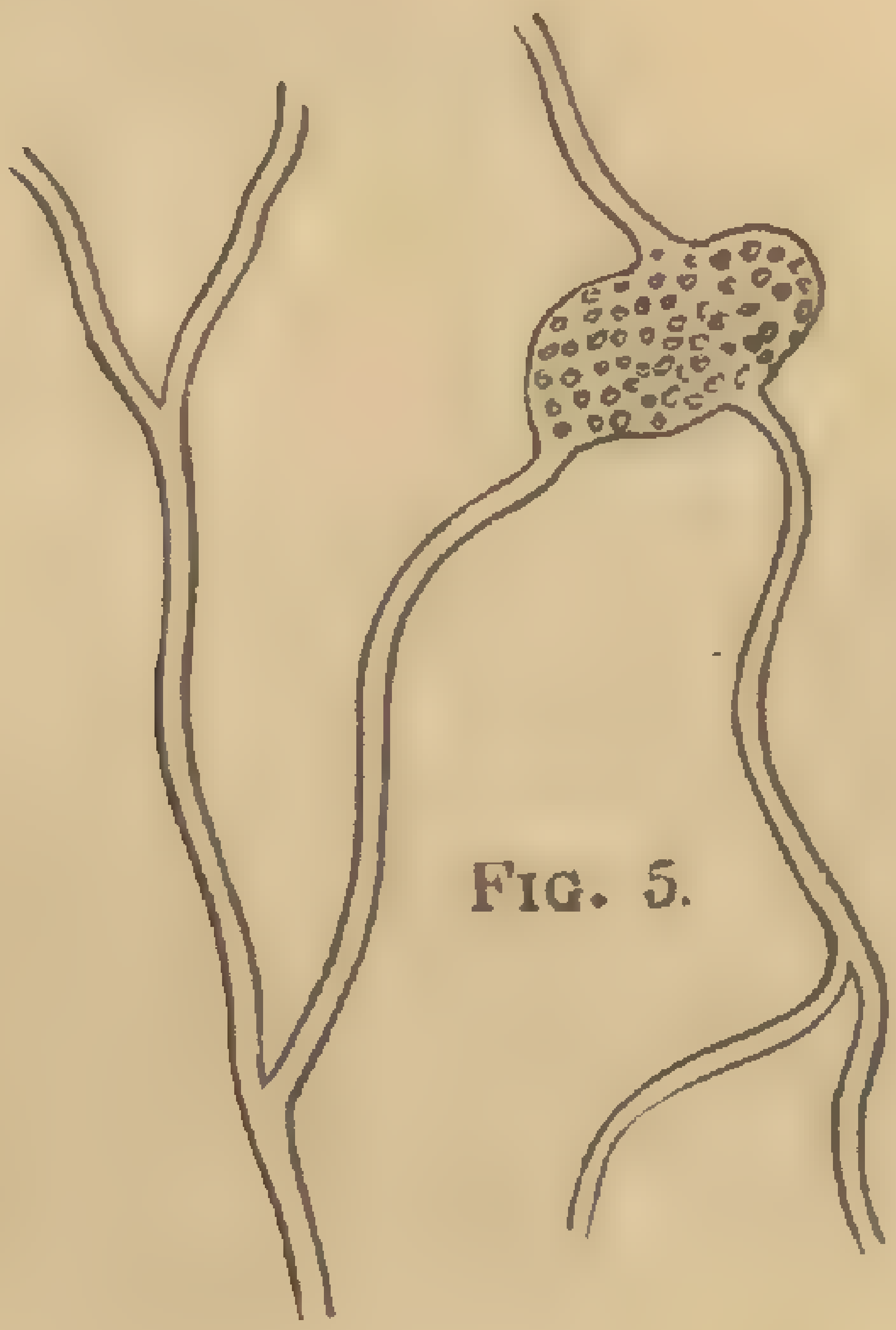


Fig. 5.

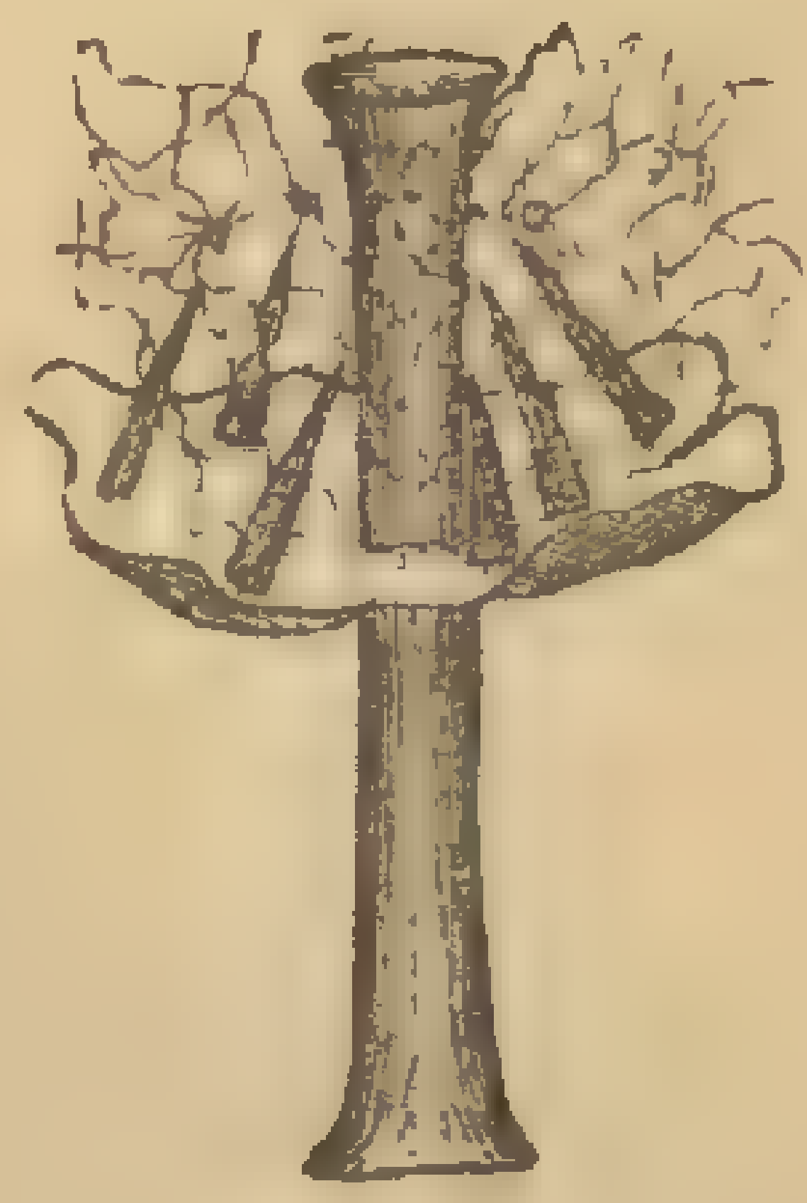


Fig. 4.

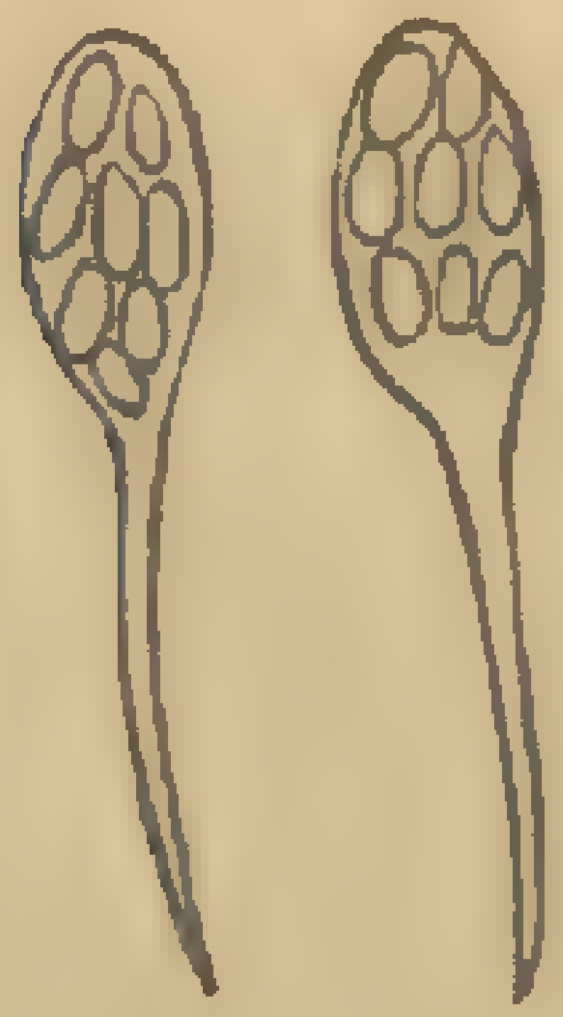


Fig. 10.

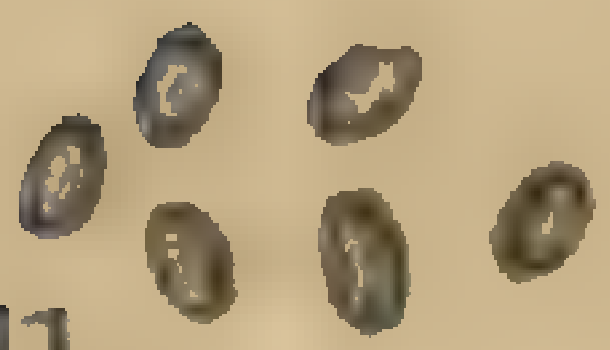


Fig. 11.

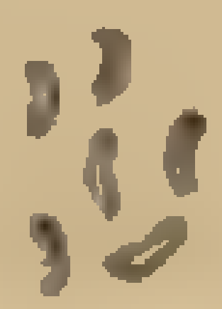


Fig. 12.

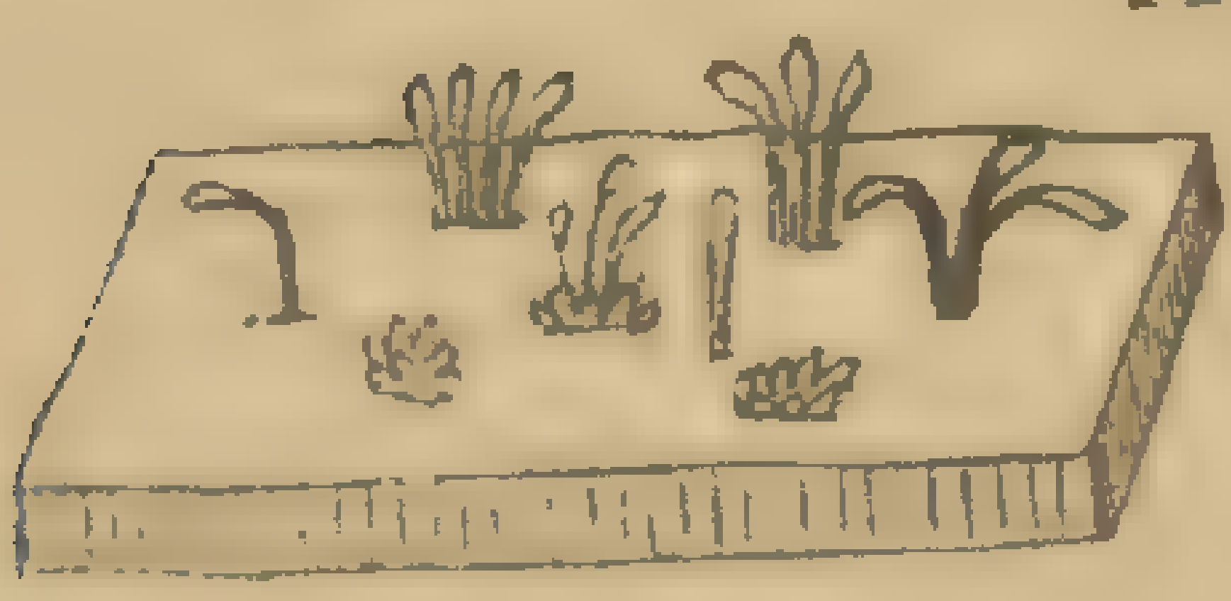


Fig. 8.

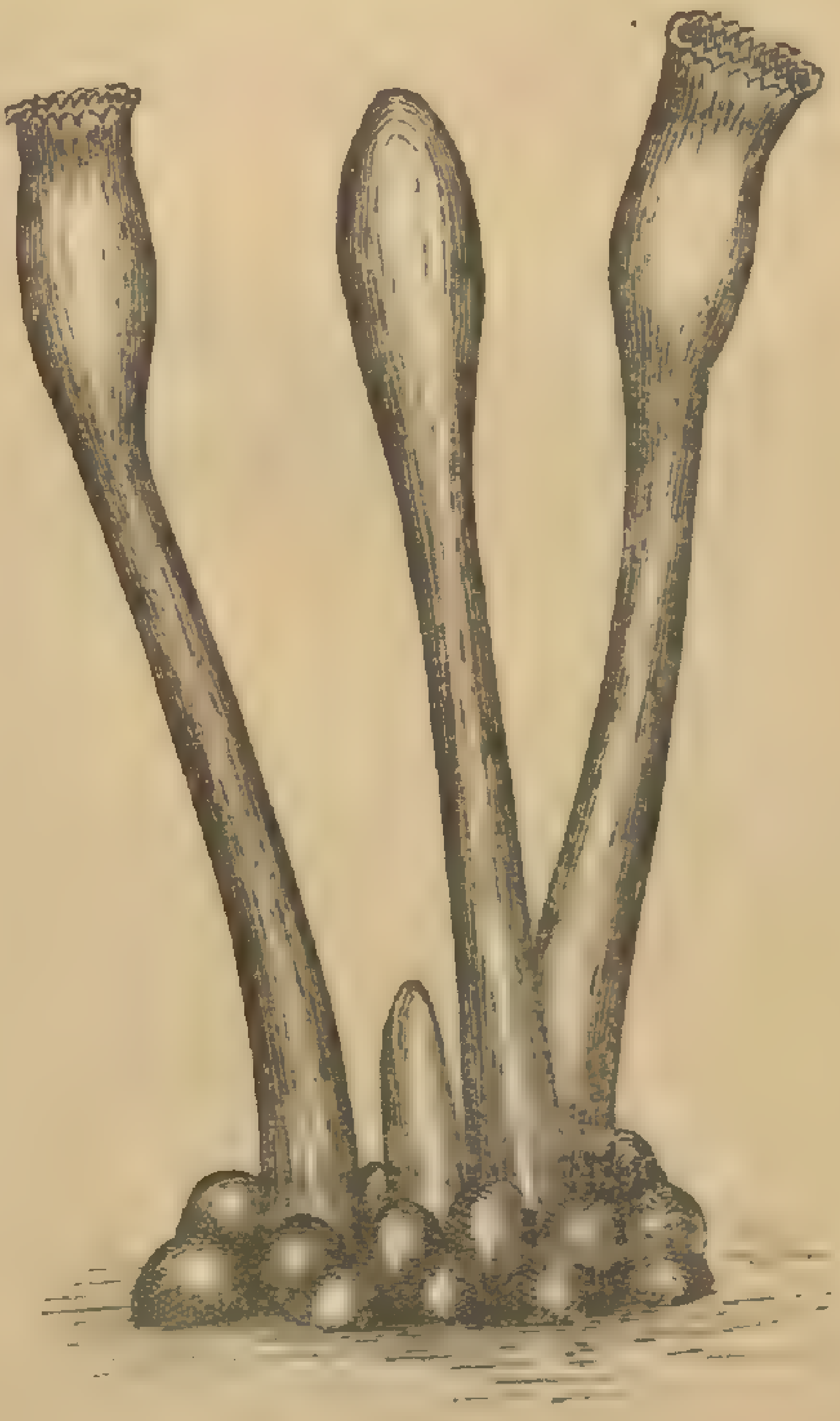


Fig. 9.

Figs. 1 to 7, Physarella mirabilis, Pk.
Figs. 8 to 12, Caliciopsis pinea, Pk.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. IX.] New York, May, 1882. **[No. 5.**

New Species of Fungi.

By Chas. H. Peck.

(Plate xxiv.)

PHYSARELLA, *Gen. nov.*

Sporangium pervious to the base, the interior walls forming a persistent, spurious columella; capillitium composed of filaments, with here and there minute knot-like thickenings, straight tubes containing lime-granules extending from the exterior to the interior walls of the sporangium, persistently attached to the former.

A genus of Myxogasters belonging to the Physaraceae, and related to the genus *Physarum*, which, as amended by Rostafinski, is quite comprehensive and includes species that are externally quite unlike in appearance. I at first regarded our plant as an aberrant species of it, and have made it known under the name *Physarum mirabile.* But, upon more mature consideration, it seems to me that the characters above-indicated make it worthy of generic distinction. The spiniform cross-bars, which are wholly independent of the rest of the capillitium, alone furnish a character too distinctive to be overlooked. The following species is the type of the genus:

Physarella mirabilis.—Sporangium cup-shaped or subinfundibuliform, minutely rough or squamulose, reddish-yellow or tawny-yellow, rupturing irregularly, the exterior part persistently adherent to the top of the stem, the interior remaining entire and forming a persistent, hollow, yellowish, spurious columella slightly broader above and open at the top; capillitium composed of pale slender filaments, and yellow thickenings of two kinds, one, minute scattered swellings in the filaments, the other, long and spine-like, extending horizontally from the exterior to the interior walls of the sporangium and persistenly attached to the former by their broader extremity, conspicuous after the dispersion of the spores; stem equal or slightly tapering upward, reddish-brown; spores globose, smooth, blackish-brown, .0003 of an inch in diameter.

Plant about one line high, on decaying wood, leaves and bark. Autumn. Michigan, Dr. D. N. DeTarr. Pennsylvania, Dr. Geo. A. Rex.

After the rupture of the sporangium and the dispersion of the spores, the threads of the capillitium remain for a time like a flocculent mass attached to the spurious columella. The spiniform tubes or cross-bars taper toward the interior walls of the sporangium, and, when this is ruptured, they break away at their inner extremity and remain fixed by their outer extremity to the exterior walls. In a vertical section of the unruptured sporangium they may be seen in position, imbedded in the mass of spores. The colored scales upon the surface of the sporangium vary considerably in size in different specimens.

CALICIOPSIS, *Gen. nov.*

Receptacle oblong-urceolate or subcylindrical, at first closed, then open and pulverulent at the apex, stipitate.

A small *Calicium*-like fungus, which does not well agree with the characters of any genus known to me, has fallen into my hands, and the present genus has been founded upon it. It partakes to some extent of the characters of some of the small substipitate species of *Cenangium*, but its more slender habit, long stem and urceolate or subcylindrical receptacle, which soon becomes pulverulent above, separate it from that genus. These same characters and its less tough or corneous substance forbid its reference to the genus *Tympanis*.

Caliciopsis pinea.—Scattered or caespitose, about one line high, glabrous, shining, black; stem slender, straight or curved, slightly thickened at the base, often growing from a cluster of black sphaeriform perithecia which contain spermatoid bodies; receptacle narrowly urceolate, sometimes a little curved or inclined to one side, slightly exceeding the stem in diameter, soon brownish-pulverulent at the apex; asci oval or subelliptical, long-pedicellate, eight-spored; spores crowded, simple, elliptical, colored, .0002-.00025 of an inch long.

Bark of living pine-trees. Vermont, C. G. Pringle.

The pecular form of the receptacle is suggestive of the dry capsules of some mosses, particularly of some species of *Hypnum*. The sphaeriform bodies and their spermatoid contents are probably only another condition of this fungus. The young stems are at first pointed, but as they increase in length they become more obtuse and finally the apex develops into the receptacle. Although the plant resembles some species of *Calicium* it is wholly destitute of any thalline crust and gonidial cells, and must be deemed a fungus. The genus should be placed among the Patellariei near *Cenangium*.

Explanation of Plate xxiv.—Fig. 1, a piece of decaying wood bearing six plants of *Physarella mirabilis*, one of them with the sporangium ruptured. -Fig. 2, two plants magnified.—Fig. 3, vertical section of the sporangium of a magnified plant showing the spine-like cross-bars imbedded in the mass of spores.—Fig. 4, a magnified plant with the sporangium ruptured and the spores dispersed. —Fig. 5, filaments from the capillitium with one of the knot-like thickenings x400. —Fig. 6, a spine-like cross-bar containing lime-granules x400.—Fig. 7, four spores x400.—Fig. 8, a piece of pine-bark bearing several plants of *Caliciopsis pinea.*—Fig. 9. a tuft of four plants magnified, two of them mature and two immature; also sphaeriform bodies at the base.—Fig. 10, two asci containing spores x400. —Fig. 11, six spores x400.—Fig. 12, six spermatoid bodies x400.

New Western Plants.

By Edward Lee Greene.

Bigelovia (Aplodiscus) Parishii.—Arborescent, 6-12 feet high; leaves lanceolate, 2 inches long, 3-5 lines wide, entire, with acute tips, sub-coriaceous, strongly punctate, glutinous, heads numerous, in crowded corymbs terminating the erect branches, small, 10–12-flowered; involucre turbinate, the scales few, irregularly imbricated, lanceolate, acute, with a green midrib, but no green tips; style-appendages filiform-subulate, a little longer than the stigmatic portion; akenes turbinate, minutely silky.

San Bernardino Mountains, California, S. B. and W. F. Parish, No. 571, collected in September and October, 1881.

A well-marked species, the largest of its genus, and most related to *B. arborescens*, Gray.

MADIA (MADARIA) CITRIODORA.—A villous-hirsute, lemon-scented annual a foot high; stem simple, leafy up to the corymbose summit; leaves all alternate, entire, 2 inches long; heads small, in a rather close, corymbose panicle; scales of the involucre with short tips; rays short and inconspicuous, greenish-yellow; akenes short and thick, for the genus, and rounded on the back, like those of *Hemizonia*, not wholly enclosed by the involucral scales; chaff of the receptacle free.

Hills about Yreka, California, collected by the writer in June, 1876.

The species is rather anomalous by its akenes, which are as near those of a *Hemizonia* as of a *Madia*; but it has strictly the habit of the latter genus, and its aspect is that of the smaller forms of *M. elegans*, Don.

HEMIZONIA (CALYCADENIA) HISPIDA.—Stem virgate, stout and rigid, 1½–3 feet high, scabrous, and somewhat hispid; leaves narrowly linear, 1–3 inches long, clothed toward the base with long setose-hispid hairs, and bearing a tack-shaped gland at summit; heads large, paniculate, or in short-peduncled, axillary clusters; rays 3–5, sulphur-yellow, deeply 3-cleft; akenes of the ray commonly smooth except on the angles and at the summit; those of the disk usually clothed throughout with a short, appressed, silky pubescence, and bearing a pappus of about 10 nearly equal subulate, barbellate-scabrous, chaffy scales.

Collected by the writer on a sandy plain in Merced County, near Atwater Station, California, in September, 1881.

In technical character the species is near *H. Douglasii*, Gray; but it is sufficiently distinguished by its stout, coarse habit, and the much larger size of all the parts of both its flowers and fruit. Dr. Gray considered it too near *H. spicata*, Greene, which was published in the BULLETIN for February, but that has, together with its white, or rose-tinted rays, very differently shaped, and almost white-villous ray-akenes.

HYMENOPAPPUS ROBUSTUS.—Floccose-tomentose; stem about 2 feet high from a biennial root, stout and rigid, simple up to the corymbose summit, leafy throughout; none of the leaves entire, all but the upper cauline 2–3-pinnately parted, the lobes linear, entire; heads large, in a loose, or, more commonly, rather compact corymb; scales of the involucre 10–12, obovate, with petaloid margins; akenes very villous; pappus half as long as the corolla-tube, its spatulate scales coarsely lacerate-toothed.

Common on the sandy plains of New Mexico; obtained by almost all collectors in the region, and heretofore referred to *H. flavescens*, Gray; but that is a perennial, inhabiting higher altitudes, is always less robust, has its lowest radical leaves perfectly entire, and all the others less finely divided than in this very distinct species.

Hieracium Rusbyi.—Stem about 2 feet high, leafy to the top, paniculate, bearing numerous, small, 15–20-flowered heads; leaves oblong-lanceolate, 3 inches long, entire or sparingly denticulate, those of the stem sessile and clasping, all clothed on both surfaces, but especially along the veins beneath, with long pilose hairs; peduncles glabrous, involucres nearly so; flowers yellow; the ribbed akenes short, columnar, truncate at the apex; pappus brownish.

Mogollon Mountains, New Mexico, Aug., 1881. H. H. Rusby.

Dr. Gray writes that the species exists in the first New Mexican collection of Mr. Charles Wright. It is, therefore, without doubt, the plant referred to *Crepis ambigua*, Gray, in Pl. Wright. i, 129, and mentioned again in Pl. Wright. ii, 106, as "a true *Hieracium*."

Hieracium brevipilum.—Stem a foot or two high, leafy only toward the base; lower leaves oblong the upper linear-lanceolate, remotely denticulate or entire, 3–5 inches long, pubescent with short, pilose hairs; heads few, rather large, in an open panicle, on long peduncles which, together with the involucre, are bristly hairy and glandular; ligules apparently greenish-yellow; pappus white or fuscous, barely equalling the fusiform, ribbed and beaked akenes.

Mogollon Mountains, New Mexico, Aug. 1881. H. H. Rusby. Also reported by Dr. Gray as occurring in Mr. Pringle's recent Arizona collection.

In Mr. Rusby's specimens the pappus is uniformly bright white, and the plant would thus seem to belong to *Crepis* rather than to *Hieracium*. But Dr. Gray informs me that *H. Fendleri*, Gray, sometimes has its pappus white; and the same is true of *H. Scouleri*, Hook. The species here described much resembles *H. carneum*, Greene, which is now more anomalous in the genus by its rose-purple flowers than by the uniform whiteness of its pappus.

Senecio Rusbyi.—Stems 2–4 feet high, with more or less of a short, white pubescence, leafy to the top; leaves nearly glabrous, ovate-lanceolate, 3–6 inches long, the lower tapering to a strongly winged petiole, the upper merely contracted above the auriculate-clasping base, acute at apex, the margins strongly dentate with sharp, salient teeth; heads large, nodding, in a rather loose racemose panicle; involucre with a few setaceous bracts at base; scales broad, with a thin, yellowish, membranous margin, and a tuft of short, white hairs at the acute tip; akenes of a light chestnut color; smooth, and strongly striate; pappus barbellate-scabrous.

Mogollon Mountains, New Mexico, collected by Mr. Rusby in August, 1881.

Allied to *S. Bigelovii*, but with smaller and more numerous heads, and a very different involucre. Dr. Gray reports it from the Santa Catalina Mountains of Arizona, collected by Mr. Lemmon.

Cupressus Arizonica.—A tall, conical tree 40–70 feet high, with horizontal branches; trunk 2–4 feet in diameter, covered with a dark red fibrous bark; bark of the branches flaking off in thin plates and leaving a smooth surface; branchlets stout and rather rigid, sharply quadrangular; leaves closely imbricated, very glaucous, neither pitted nor glandular; their margins entire, or, in the very oldest, denticulate; cones crowded on short, stout peduncles, globose, about an inch in diameter, of 6–8 very thick, and strongly bossed scales; seeds numerous, 2 lines or more wide.

This fine cypress was discovered by the writer on the mountains back of Clifton, in the extreme eastern part of Arizona, on the first day of September, 1880.

Abundant specimens of wood, and fruiting branches were secured, and soon distributed, under the above name, to the principal herbaria of this country, and several in Europe, including that of the Royal Gardens at Kew.

In the course of the year and a half that has since intervened, the species has been collected at different points in the southern and eastern portions of the same Territory, by Messrs. Rusby, Pringle and Lemmon. The tree is peculiar in that, while the bark of its trunk is as shreddy as that of any cedar, that of the branches, even the larger ones, is scaly, falling off in thin plates. The wood is light and straight grained, splitting with the utmost readiness; that of the heart being dark red, resembling that of red cedar. The branchlets bear so strong a likeness to those of *Juniperus pachyphloea*, Torr., that without fruit they are hardly distinguishable. It is the principal tree of the mountains which lie to the north of Mt. Graham, and forms dense forests, particularly on the northward slopes.

Notes on New England Algae.

By W. G. Farlow.

Since the appearance of my paper on New England Algae, I have received a number of interesting species, new to our coast, from Mr. F. S. Collins of Malden, Mass., and Rev. J. D. King, of Edgartown, Martha's Vineyard. In 1881 Mr. Collins sent a specimen, collected near Little Nahant, which resembled a small *Asperococcus*, and which could not at the time be determined. In March of this year he succeeded in finding a considerable number of specimens of the same species in excellent condition, and, through his kindness, I have been enabled to examine both living and dried specimens. The alga in question is of a decided olive-brown color when fresh, and becomes somewhat greenish in pressing, in this respect resembling some of the *Asperococci* and *Punctariae*. The frond is tubular, and resembles strongly the species of *Asperococcus* in habit, but even in its adult condition it is composed of a single layer of cells, which are generally associated in fours and are of a gelatinous texture. Were it not for the distinctly brown color, one would be inclined to consider the plant as a species of *Prasiola*, especially if examined after having been dried. There can be no doubt, however, that it belongs to the *Phaeosporeae*, and it appears to me to constitute a new genus (*Phaeosaccion*) of that suborder, differing from other genera in having its tubular frond composed of a single layer of rather gelatinous cells. The genus must be regarded as one of the lowest of the suborder, simpler even than *Scytosiphon*, where there is more than one layer of cells, and where the surface is covered with plurilocular sporangia and hairs. In *Phaeosaccion* one sees the relationship of the *Phaeosporeae* to the *Florideae* in their lowest representatives, the *Porphyreae*, and, on the other hand, to the *Chlorosporeae* in the genus *Prasiola*. The fronds of *Phaeosaccion Collinsii* are generally gregarious, and start from a common mass of cells, any of which may grow into a short filament composed of a single row of cells. By a longitudinal division of all except the terminal cell, a frond is formed consisting of two rows of cells ending in a single apical cell. By subsequent transverse and radial divisions, a tubular or saccate frond is formed, composed of a single thickness of cells. The division of the cells into fours is tolerably regular, and, when the plant matures from each ultimate division, there is formed, as far as could be ascertained, a single zoospore which escapes and leaves behind the colorless cell-walls. Only a small number of the specimens examined by me had produced zoospores; and these, at the time of examination, had come to rest, so that it was impossible to tell anything about the number of cilia. On this point further examination is necessary. The genus may be provisionally characterized as follows:

PHAEOSACCION, Farlow.

Fronds olive-brown, tubular, or saccate, composed of a single layer of cells disposed in fours. Hairs wanting. Reproduction by zoospores produced singly (?) in each cell. Cilia ?

PHAEOSACCION COLLINSII, Farlow.—Fronds subgelatinous, gregarious, compressed-cylindrical, $\frac{1}{8}$ inch to 1 inch broad, about 2–8 inches long, at first saccate, becoming cylindrical, apex at length ruptured. Cells squarish, 3.8μ–7μ broad; frond 8μ–10μ in thickness. On *Zostera*. Little Nahant, Mass., in early spring. Mr. F. S. Collins.

Among the plants received from Rev. Mr. King were fine specimens of *Striaria attenuata*, some of them a foot long. They were washed ashore at Edgartown in January, and Mr. King supposes them to have grown at the mouth of Edgartown Harbor. Some of the specimens perfectly resemble European specimens of the species, and bear the well-known unilocular sporangia in abundance. Some of the specimens, however, are small and slender, and the surface of the branches is covered with plurilocular sporangia, which I believe have never before been seen. The plants bearing the plurilocular sporangia resemble those bearing the unilocular, in microscopic structure, although, as before said, their habit is much more slender; they are, however, solid and not hollow, as is the case with the large specimens, but in its young stage *Striaria* has a solid frond. Were it not that one of the unilocular-bearing specimens sent by Mr. King was as small and slender as those bearing plurilocular sporangia, I should have hesitated to consider the specimens as all belonging to the same species. The unilocular sporangia, which resemble those of *Punctaria*, are found scattered over the larger branches, and sometimes also on the smaller polysiphonous branchlets which end in the hairs characteristic of the trichothallic growth of *Striaria*. They arise from the cortical cells, which divide irregularly, and increase in size so that they project in well-marked papillae, above the surface. The general shape of the sporangia is ovoid, but, when several contiguous cells are transformed into sporangia, they become cuboidal or prismatic by pressure. Judging from Mr. King's specimens, the plurilocular plant of *Striaria* is smaller, finer, and less fully developed as to the frond, than the unilocular plant. Whether the plant which bears plurilocular sporangia continues to grow, and afterwards produces unilocular sporangia, I have no means of determining, but such is apparently not the case.

Another interesting plant sent by Mr. King, but only in a very small quantity, is closely related to *Capsicarpella speciosa*, Kjellm., a species afterwards removed from *Ectocarpeae* by Kjellman (Algenvegetation des Murmanschen Meeres, p. 29), who believes that the unilocular sporangia contain a single spore, and not numerous zoospores, and consequently places the species, with one other, in a new genus *Scaphospora*, under the *Tilopterideae*. I have examined one microscopic preparation and one pressed specimen sent by Mr. King, and in both there are unilocular and plurilocular sporangia, which, in general, resemble Kjellman's figure of *C. speciosa* (Bid. Skand. Ectocarp. och Tilopter, pl. i, fig. 3), but which are smaller than the measurements given by Kjellman. Our species more nearly resembles, as far as measurements go, *Sc. arctica*, Kjellm., but is apparently smaller. The species may be provisionally described as new, although farther comparison may show it to be a form of one of the two species mentioned. Furthermore, although in as good condition as is usually the case with mounted specimens of this group of algae, it is impossible to say whether the contents of the unilocular sporangia form a single spore or are going to divide into numerous zoospores. Assuming the former to be true, our plant would come under *Scaphosphora*, and is the only representative of the *Tilopterideae* yet found on our coast.

SCAPHOSPORA (?) KINGII, Farlow.—Main filaments 4 inches long, loosely and irregularly branching, cells 70μ–75μ broad, usually shorter than broad, secondary branches short, revolute, beset with numerous secund, pectinately-compound branchlets, which end in long hairs. Unilocular sporangia borne on the penultimate branchlets, compressed-globose, 45μ–58μ in diameter, solitary, produced by the division of a branch-cell into two parts. Plurilocular sporangia borne on the ultimate branchlets, 35μ–40μ broad, 75μ–150μ long.

Washed ashore at Edgartown, Mass. Rev. J. D. King, January, 1882.

In the month of August, 1881, I collected at Wood's Holl, Mass., a *Gloeocapsa*, which, at the time, was growing in considerable quantity on the eel-grass, but which soon disappeared. I had seen it occasionally in previous years, but never before in condition to describe. Its color is almost precisely that of living diatoms, for which it might pass in the masses of slime in which it generally occurs.

6 Gloeocapsa zostericola, Farlow.—Forming shapeless, gelatinous, brownish masses. Cells flattened-hemispherical, concave on the inner surface, about 19μ–26μ long by 9μ–11μ broad, united in twos or fours into colonies of from 40μ–100μ in diameter, with numerous distinct, enveloping layers.

On *Zostera*, mixed with *Calothrix*, etc. Wood's Holl, Mass., August, 1881.

In my paper on New England Algae, I stated that *Callithamnion versicolor* was known in this country only in its seirosporic condition. Last summer I found specimens at Wood's Holl which showed true favellae and tetraspores also, as are recorded in Europe by Bornet in Études Phycologiques, p. 71. A specimen of *Callithamnion Plumula*, collected at Gay Head in September, is of interest as showing antheridia, with regard to which little seems to be known in the sub-genus *Antithamnion*. The antheridia are in oblong tufts formed by the transformation of the ultimate secund branchlets, and remind one of Harvey's figure of *Callithamnion polyspermum*, Phyc. Britt., pl. 231, fig. 6.

Fern Notes. IV.

By Geo. E. Davenport.

Aspidium trifoliatum, Swartz.—Dr. Engelmann has very kindly favored me with a portion of a specimen of this fine *Aspidium*, which was collected "in the entrance to a limestone cave, on its perpendicular walls, not far from New Braunfels, Texas," in 1878, by the lamented Lindheimer, who was thus the first to collect this species within the limits of the United States.

Botrychium simplex, Hitchcock.—Mr. W. N. Suksdorf, of White Salmon, W. T., sends a fine, compact, very fleshy, ternate form of this species, the whole plant scarcely more than 1½ inches tall, from Mt. Adams.

Mr. Suksdorf has collected some eighteen species of the ferns of Washington Territory, including two extreme forms of *Botrychium ternatum*, the normal form of *Asplenium Trichomanes*, *Cryptogramme acrostichoides*, *Pellaea densa*, *Gymnogramme triangularis* and *Aspidium aculeatum*, var. *scopulinum*; and the specimens which he has sent me are exceedingly fine and well selected. His sets are desirable, and well worth the price at which he advertises them.

Miss Furbish also collected, last season, *B. simplex* in Bridgewater, Aroostook Co., Me., where she reports it as being quite abundant.

Woodsia Plummerae, Lemmon.—Since my notes for the February Bulletin were prepared, I have received specimens of this fern authenticated by its author's ticket, and my foot-note (*l. c.*, p. 22) requires modification in so far as it seemingly places this fern with *W. Mexicana*; it is rather a very glandular form of *W. obtusa*, but none the less identical with much of the other collections mentioned, and which appear to be considerably mixed. *Woodsia Oregana*, although normally smooth, is sometimes quite glandular (as in some specimens which I have from Dakota), but in *W. obtusa* the normal form itself is often more or less glandular (a character which does not appear to be at all constant), so that it does not seem to be worth while to recognize the present fern even as a variety.

Pteris aquilina, L.—A year or two ago, Mrs. S. M. Piper sent me a curiously curled and twisted form of this species which she found growing in Sandisfield, Mass., in 1877; and later on I received indirectly from Jackson Dawson, of the Bussey Institute, specimens of the same form from cultivated plants, which were originally found by him growing in open meadow-land in Georgetown, Mass. The plants had been observed by Mr. Dawson for several successive seasons in considerable abundance, and those taken up by him had since retained their peculiar character.

A similar form has been found many times in England, where it is known as the var. *crispa* of Wollaston, and its occurrence in this country is interesting as a matter of record. Moore describes two forms of it, one with "*undulate* and *reflexed margins*," and the other with "*crenate* and *wavy margins*." Deakin figured a portion of it in Florigraphia Brittanica, but—very judiciously as it seems to me—did not recognize it as a variety. The plants of this form which I have seen are dwarfed in habit, and their whole appearance indicates an unhealthy, diseased vitality, which, however, might possibly be restored to its normally healthy condition by a special course of treatment adapted to its needs.

A rich Fern-Field.—The presence of *Pellaea aspera*, *P. pulchella*, *P. flexuosa*, *Cheilanthes leucopoda*, *C. microphylla*, typical *Notholaena candida*, *N. sinuata* and *Anemia Mexicana* in a package containing some imperfect specimens from Uvalde Cañon, Texas, indicates a region that would well repay exploration by some keen-eyed collector, and it is to be hoped that the time is not far distant when the treasures which this list reveals will be made available for distribution.

Florida Ferns.—Mr. A. H. Curtiss has sent me some very interesting notes on the Florida Ferns which he has collected during his explorations in that State, and later on I may give some extracts from them. The "good things" which this very careful and thoroughly systematic collector has in store for those who receive his fascicles for 1882 will shortly appear, and give others no less pleasure than a knowledge of them has given me.*

Medford, Mass., March, 1882.

Notes on New England Algae.—The following species, observed by the writer, are either new to this region or are from other localities than those given in Prof. Farlow's Manual of the Marine Algae of New England. To the author of that model work the writer is much indebted for assistance in identification, etc., as well as for many similar kindnesses on former occasions.

Rivularia Warreniae, Thuret.—I found this species in August and September 1881, at Marblehead, Mass., where it grew on a rock, above high-water mark, but where the spray formed little pools in rough weather. The thallus is brownish-olive, in form and consistency somewhat resembling *R. plicata*, Carm., but of different microscopical structure. It is the *Schizosiphon Warreniae* of the Phycologia Britannica, and has not before been reported in America.

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* Mt. Washington, given as the station for *Aspidium Filix-mas* in my account, in the February BULLETIN, of Mr. Pringle's discovery of that fern in Arizona, should have been Mt. Wrightson.

Palmella rupestris, Lyngb.—In August, 1880, I found at Hunnewell's Point, Maine, in a locality very much like that of the *Rivularia* just mentioned, a small quantity of this species. It was in a soft jelly-like mass, which contained several other minute algae. This species also has not been previously found in this country.

Porphyra leucosticta, Thuret, I found at Nahant in June, 1879. It was very abundant at that time, the water being almost full of it; but, though I have often visited the locality since, at the same and other seasons of the year, I have never seen it again. It is easily distinguished from the omnipresent *P. laciniata*, Ag., by its softer consistency and delicate rose-purple color; and the microscopic structure is quite distinct, the antheridia forming small spots among the spore-cells, and not a distinct marginal zone. It is a more southern species than *P. laciniata*, and occurs throughout most of Europe. It has not yet been recorded for our Atlantic coast, though Prof. Farlow, in his Manual, considers its occurrence here probable.

At the same time and place that I collected this species, I found a single plant which I think may be identical with the

Ectocarpus brachiatus, Harv., of the Nereis Boreali-Americana. The localities there given are South Boston and Lynn, Mass., and Prof. Farlow, in his work quoted, states that it is known in this country only by Harvey's description. My plant agrees quite well with an authentic specimen of *E. Griffithsianus*, Le Jolis (*E. brachiatus*, Harv.), but, according to Bornet (Études Phycologiques, p. 16, note), the structure of this species agrees rather with the genus *Phloeospora*, Areschoug, it having, especially in the larger filaments, a cortical layer of quadrate cells, arranged in regular series. He proposes for it the name of *Phloeospora brachiata*, under which name it would be the only representative of the genus yet found in this country.

Monostroma Blyttii, Wittr., the largest of our species of the genus, is reported in the Manual as growing luxuriantly at Eastport, Maine, but reaching its southern limit at Nahant, occuring there in a reduced form, not generally more than two or three inches long. This diminished size at Nahant is confirmed by my experience, as I have found few specimens there exceeding the dimensions just given; but, rather curiously, at Revere Beach, just south of Nahant, it occurs in October and November in abundance, the fronds sometimes more than a foot high and proportionately broad, growing on shells and pebbles near low-water mark.

Monostroma crepidinum, Farlow, a species founded on a plant growing at Wood's Holl, on the piles of the Government wharf, I found at Juniper Point, Salem, last August. As at Wood's Holl, it grew on the piles of a wharf, near low-water mark, and it seems probable that it might be found in similar stations along the coast, escaping the notice of collectors from its resemblance to the Ulvas so abundant in such places.

Myrionema Leclancherii, Harv., on record at Gay Head only, I have found at Marblehead; and

Gracilaria multipartita, Ag., known north of Cape Cod only in the interesting locality at Goose Cove, Squam, is plentiful in the Mystic River marshes, near Boston.

Saccorhiza dermatodea, De la Pyl., I found growing just below low-water mark round a little island off Marblehead, and I picked up a number of fronds washed ashore at Marblehead Neck; they were nearly, if not quite as large as specimens that I collected in Portland Harbor, Me.

Malden, Mass., March 8, 1882. FRANK S. COLLINS.

Ophioglossum nudicaule, L. fil.—The *Ophioglossum* collected ✓ by Dr. Parry and Mr. Cleveland in San Diego, California, in March and April, proves to be this species, rather than *O. vulgatum*.

The specimens collected in March were too immature to permit of a positive identification, but those which have been collected since are nearly mature, and are certainly nearer to *O. nudicaule* than to any other species.

Some of Dr. Parry's April specimens suggested *O. Lusitanicum* to me, but others in a more advanced state of maturity, since received from Mr. Cleveland, agree very well with *O. nudicaule*, and justify Prof. Eaton's suggestion (*in litt.*) that they belong to that species.

The California specimens are somewhat larger, and, for the most part, more fleshy than my Florida specimens, but show the characteristic disposition of this species to develop two or more fronds from the same root-stock.

In one of Mr. Cleveland's specimens, a root branches in opposite directions, forming a single horizontal rootlet on which two young plants arise from buds produced full three inches apart. The plants vary from $1\frac{1}{4}$ to $3\frac{1}{2}$ inches in height. In most specimens the fleshiness of the lamina wholly obscures the venation, but in others apparently becomes thinner and more membranaceous from age. The venation may be distinctly seen by holding the specimen to the light. The fertile branch arises from the base of the lamina; and the fruit-spike, which is raised on a foot-stalk half the length of the plant itself, bears from 10 to 20 sporangia. Both laminae and fruit-spikes exhibit a tendency toward acuminate apices, though not in so marked a degree as in my Florida specimens.

This species has heretofore been recorded in the United States only from the South Atlantic and Gulf States, and its present discovery (or re-discovery, as it was originally collected in San Diego, by Dr. Parry in 1850, when the specimens were unfortunately lost before being identified) so far away from this region is a most interesting one which may lead to the detection of intervening stations.

As suggested by Mr. Cleveland, some close ground work, with keen eyes, at the right seasons of the year, will probably show that this fern is not so rare as generally supposed.

My thanks are due, both to Dr. Parry and Mr. Cleveland, for specimens in different stages of maturity. A note from the latter, just at hand, states that the little fern is already disappearing, thus indicating its limited season to be of from six to eight weeks' duration.

Medford, Mass., April 22, 1882. GEO. E. DAVENPORT.

A propos of a Paper on the Vitality of Seeds.—I think I can understand why a striking article on "The Germination and Vitality of Seeds," by Richard E. Kunzé, M D., is "published by subscription of members of the Club"; but I do not understand why I am reported to give, in "How Plants Grow," "extracts from a paper drawn up by the Rev. Dr. Marks," the said paper being a circumstantial account of the germination in Illinois of some seeds taken from a rose-hip found in the hand of an Egyptian mummy, estimated to be about 2500 years old. I am sure there is nothing of this in "How Plants Grow," and I greatly wonder that any one should have supposed that I should have thought the account, upon the face of it, was worth mentioning, even for the sake of showing that it is quite fallacious. Dr. Kunzé can perhaps explain how he came to connect my name with this narrative.

Cambridge, Mass. ASA GRAY.

(The above note has been submitted to Dr. Kunzé, who desires us to express his regret for having inadvertently copied an entire paragraph and credited it to "How Plants Grow," while only the first sentence of the note should have been ascribed to that work. The error arose through Dr. Kunzé's somewhat defective eyesight, which led him to overlook quotation-marks. We are informed that Dr. Kunzé has made an explanation to Dr. Gray by letter. The above disclaimer, with these few remarks, will serve to set the matter right with those who have read the paper in question.—ED.)

Notes from Chemung County, N. Y.—In my former notes from this county I neglected to mention that I found *Hydrangea arborescens*, L., growing on the rocks at the Wellsburg Narrows. This was in 1879. I have since found it in a cool ravine one mile west, on the north side of the Chemung, in the town of Elmira. I have no record of its having been found elsewhere in the State. It is certainly quite common in the northern part of Bradford County. I hope it will be looked for by those working in Tioga and Broome Counties, as I desire to know its geographical distribution. The elevation here is about 824 feet above tide-water. May that not influence its range into this State? I have never seen it in Steuben County, whose elevation increases westward. C. D. Fretz, M.D., of Sellersville, Pa., informs me that some years ago he found *Polemonium caeruleum*, L., in a bog near Apalachin, Tioga County, N Y. I shall look for it there this coming season. Have *Poa caesia*, Smith, *Eriophorum vaginatum*, L., and *Lespedeza Stuvei*, Nutt., been found in New York State? Can anyone give me a station for *Carex cephaloidea*, Dew.?

Lowman, N. Y. THOS. F. LUCY.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. IX.] New York. June, 1882. [**No. 6.**

New Species of North American Fungi.

By J. B. Ellis.

Ombrophila albofusca. — Orbicular, ½–1 mm. in diameter, dirty white when fresh, becoming darker in drying; margin very thin and narrow; asci clavate-cylindrical, .0003′–.00035′x.0003′–.0004′; paraphyses filiform; sporidia oblong or oblong-fusiform, hyaline, 2-nucleate, mostly in the upper part of the asci, .0003′–.00045′ x .00015′–.000175′.

On bark of *Magnolia glauca.*

Peziza (Tapesia) cornuta.—Gregarious, minute, dull white (flesh-color when dry), sessile, thin membranaceous, subfibrous, margin sparsely fringed with straight, 4–5-septate, white, spreading hairs; asci clavate-cylindrical, .002′–.0025′x.00035′–.0004′; paraphyses filiform; sporidia biseriate, fusiform, 3-nucleate and at length uniseptate, .0005′x .00015′, each end furnished with a short bristle-like appendage.

I have not seen *P. arachnoidea*, Schw., but that is said to be "white villous," while this is only ciliate.

On decaying chestnut-wood. Westchester, Pa., June, 1879.

Sphaeria (Anthostoma) mortuosa.—Perithecia scattered, depressed, covered by the cuticle, which is elevated, blackened and pierced by the short cylindrical ostiolum; asci cylindrical, sessile, about .004′x .0004′; sporidia uniseriate, broad navicular, 1–2-nucleate, dark brown, .0005′–.0007′x .0003′.

Nearly allied to *Anthostoma Italicum*, Sacc. & Speg.

On basal sheaths of old *Andropogon*; also on dead stems of *Polygonum* and *Eupatorium purpureum.* (N. A. F., No. 897.)

Sphaeria graopsis.—Perithecia scattered, erumpent, membranaceous, globose or subelongated, partially collapsing above, .001′–.0015′ in diameter, rough and more or less covered with fragments of the bleached fibres of the wood; ostiolum papilliform, slightly prominent, surrounded by a slight depression; asci oblong, mostly bulging on one side, sessile, .002′–.0023′x .0008′–.001′; paraphyses none; sporidia 8, inordinate, oblong-elliptical or oblong-navicular, hyaline at first, becoming pale yellowish-brown, endochrome once divided, .0008′–.001′x .00035′–.0004′.

Allied to *S. Eckfeldtii* and *S. inflata*, Ell.

On decorticated pine poles. (N. A. F., No. 780.)

Ceratostoma carpophila.—Perithecia subglobose, .003′ in diameter, rough; ostiolum capillary, three times or more as long as the diameter of the perithecia, and more or less crooked or bent; asci slender, about .002′ long; paraphyses filiform; sporidia uniseriate or biseriate, fusiform, yellowish, .000175′–.00025′ long.

The fruit is almost exactly that of *Sphaeria echinophila*, Schw., which is found with it. The perithecia and ostiola are beset with coarse, erect, scattering hairs, which may be only the erect threads of some parasitic mold.

Asterina Plantaginis.—Perithecia innate, hemispheric, .003′ in diameter, clustered on brownish, immarginate spots which are scattered irregularly over both sides of the leaf, but more abundantly on the upper surface; asci ovate-elliptical, .001′–.0013′x .0005′; sporidia crowded, oblong, obtuse, hyaline, 2-nucleate, slightly constricted across the middle, .00035′–.0004′x .0002′; mycelium nearly obsolete, consisting of a few brown threads radiating from the base of the perithecia, or entirely wanting.

On living leaves of *Plantago major*. Philadelphia, Pa., Oct., 1881. Dr. Geo. A. Rex. (N. A. F., No. 791.)

Sphaerella Magnoliae.—Perithecia buried in the parenchyma of the leaf, either collected in patches, giving the leaf, especially the under surface, a clouded appearance, or sometimes occupying nearly the entire surface; ostiola mostly hypophyllous, barely piercing the epidermis; asci sublanceolate; sporidia mostly biseriate, clavate-oblong, pale straw-color, faintly nucleate, .00025′x .0001′.

Quite distinct from *Sphaeria Magnoliae*, Schw., which renders the leaf bullate..

On fallen leaves of *Magnolia glauca*. December. (N. A. F., No. 800.)

Sphaerella hypericina. — Amphigenous. Perithecia minute, erumpent in little tuberculiform clusters of two to six; asci oblong, .001′–.0012′x .00015′–.0002′; sporidia crowded, clavate-oblong, uniseptate, often bent at the middle, yellowish, .0004′–.00045′x .0001′.

On fallen of *Hypericum prolificum*. (N. A. F., No. 797.)

Hendersonia Xerophylli.—Perithecia oblong, covered by the epidermis, which is elevated, blackened and fissured longitudinally above them; spores oblong, obtuse, pale brownish, 1–3-septate, the extreme septum mostly very faint, or often wanting.

On fading leaves of *Xerophyllum asphodeloides*. May.

Septoria Trifolii.—Perithecia subcuticular, but soon exposed by the peeling off of the epidermis, gregarious, forming little elongated patches, or scattered evenly over the matrix; spores fusiform, curved, granular, .0008′x .00015′–.0002′, resembling the spores of a *Cryptosporium*.

On dead stems of *Trifolium pratense*.

Septoria Galiorum.—Perithecia punctiform, minute, scattered, appearing like little black shining points; spores acicular-filiform, slightly curved, .0008′–.001′ long, faintly septate.

On dead stems of *Galium*.

A list of Grasses collected by Mr. C. G. Pringle in Arizona and California during the Summer of 1881, with Descriptions of those Species not already described in American Publications.—Some of these species are not well made out, and may prove new. I much regret that I did not have access to Fournier's work on the Mexican Grasses in the compilation of this list. Those species which appear in Mr. Pringle's distributed sets are marked with an asterisk (*).

1*. *Paspalum distichum*, L., Amoen. Acad., v., 391.—Santa Cruz Valley, near Tucson. June.

2*. *Eriochloa punctata*, Hamilton, Prod., 5.
=*Paspalum punctatum*, Flugg., Mong., 127.
=*Milium punctatum*, Linn., Am. Acad., v., 392.
=*Helopus pilosus*, Trin., Agrost., 104.
=*H. punctatus*, Nees. Vasey, in Bot. Wheeler Exped., p. 296.
Santa Cruz Valley, near Tucson.

The same as No. 821 of E. Hall's collection of Texan plants, excepting that the awn of the flowering glume is much shorter than in Hall's plant. There is the same difference between this and West Indian specimens. No. 824 of E. Hall's collection, ticketed *Helopus mollis*, C. Müll., is a species of *Panicum*, named by Buckley, in herb. Acad., Phila., *P. ciliatissimum.*

3. *Panicum sanguinale*, L., Sp. Pl., i., 55. Near Camp Lowell. July.

4*. *Panicum leucophaeum*, HBK., Nov. Gen., i., 97; Vasey, Bot. Wheeler Exped., 295.
=*P. lachnanthum*, Torr., Pac. R. R. Surv., vii., p. 21.
=*Tricholaena insularis*, Griseb., Flor. Br. W. Ind., 557.
=*Andropogon insulare*, L., Am. Acad., v., 412.
Near Camp Lowell. July.

This is the same as No. 722 of Lindheimer's collection of 1847. Reverchon sends it from Texas, and Brandegee from Colorado. Specimens from the South-west differ much in appearance from Florida plants referred to this species, collected by A. H. Curtiss and Dr. Palmer. The culms are not so stout, the leaves are more numerous, shorter and narrower; the panicle is shorter, with fewer and shorter branches, and the wool of the spikelets is whiter. These differences may be due to differences in soil, climate, degree of moisture, etc. The species is widely distributed, being found in the tropical and sub-tropical regions of both hemispheres. The Australian specimens are said to vary much, especially in the degree of the development of the inflorescence (vid. Flor. Austr., vii., p. 472).

5*. *P. capillare*, L., var.?—Culms caespitose, geniculate and branched below, smooth, a little hirsute at the nodes; sheaths somewhat inflated, sparsely pilose, copiously so along the margins above and at the throat; leaves lanceolate, 2–3 in. long, 3–5 lin. wide, scabrous on the margin, with a few long hairs near the base. Panicle virgate, the branches single or in pairs, ascending, the lower ones about 2 in. long. Spikelets 1½ line long, on short and unequal pedicels, pointed; lower glumes acute or pointed, ½–⅔ as long as the second; second glume a little longer than the third, ovate-lanceolate, acuté, 7-nerved, slightly scabrous at the tip; third glume in form like the the second, 7–9-nerved, neutral, with a palea ½ a line long; fertile flower smooth and shining, obtuse, less than a line long.

Santa Cruz Valley, near Tucson. (No. 464.)

The habit of this grass is well marked, and it may prove a good species. The spikelets are exactly like those of No. 817 of E. Hall's Texan plants, referred to *P. proliferum*, but it differs much from that in its low, branched habit, pilose sheaths, short and rather broad leaves—characters which point to *P. capillare*, L., to which it is doubtfully referred. The habit of the panicle is more like *P. proliferum*, while the prominently 3–5-nerved, pointed, lower glume and the palea to the third glume are characters not found in Eastern specimens of either *P. capillare* or *P. proliferum*, but point to *P. virgatum*, L. The third glume of the latter, however, is staminate and the fertile flower is more turgid.

6*. *Panicum fuscum*, Swartz.—Santa Cruz Valley, near Tucson. June.

Apparently the same as No. 825 of E. Hall's Texan plants, but more slender, with leaves and sheaths smoother. It is probably the *P. reticulatum*, Torr. (Marcy's Rept.)*

7. *Panicum* (*Virgaria*) sp., allied to *P. fuscum*, Sw.—Culms prostrate below, rooting at the lower joints, smooth, as are the numerous ascending branches, except just below the panicle; sheaths striate, smooth, slightly inflated, shorter than the internodes; leaves linear, cordate and clasping at the base (1½–5 in. long, 3 lines wide), scabrous on the cartilaginous margin, which is also pilose near the base. Panicle at length exserted, 3–6 in. long, the axis and the ascending or erect simple branches finely pubescent, and also sparsely pilose with rather stiff, spreading hairs; the lower branches about 2 in. long, bearing the approximate but not crowded, racemose spikelets in pairs (the upper ones single), one nearly sessile and often imperfectly developed, the other on a pedicel nearly its own length; pedicels pilose and finely pubescent. Spikelets oblong or obovate, somewhat pointed (1½ line long), the three outer glumes pubescent; lower glume deltoid, obtuse, 5-nerved, ⅓ as long as the spikelet; second and third glumes sub-equal, as long as the fertile flower, the second 7-nerved, the third 5-nerved, with a palea; nerves with connecting reticulations above. Fertile flower nearly 1½ line long, pointed and transversely rugose, slightly compressed on the back.

Santa Cruz Valley, near Tucson. (465.)

I have not seen this before in North American collections, but it probably belongs to some of the described species allied to *P. grossarium*, L., or *P. fuscum*, Sw. The spikelets resemble those figured in Trinius's Icon. Gram., for *P. velutinosum*, Nees.

8. *Panicum obtusum*, HBK., Nov. Gen., i., 98; Vasey, in Bot. Wheeler Exped., p. 294. Santa Cruz Valley, near Tucson. May.

The same as 960 of C. Wright, and 827 of E. Hall's Texan collection. T. S. Brandegee collected the same in Arkansas Cañon and near Cañon City. (vid. herb. J. H. Redfield.)

9. *Panicum maximum*, Jacq., var. *bulbosum*.—Rocky cañons, Santa Rita Mts., Arizona.

This appears to be a good species, and is referred as above with some doubt. It is like No. 958 of Parry & Palmer's collection in Central Mexico, 1878.

10. *Panicum scoparium*, Lam., Encycl., iv.; Thurber, Bot. Cal., ii., p. 259; *P. pauciflorum*, Ell.? ; Gray's Manual, p. 648. By streams of the Sta. Catalina Mountains.

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* Since the note on this species was written, I have seen specimens of No. 2,091 of C. Wright's N. Mex. collection (1851–'52) and find it to be the same. Dr. Torrey, in Marcy's Report, says that No. 2,090 and No. 2,091 of Wright's collection are glabrous and more robust forms of his *P. reticulatum*.

11. *Panicum dichotomum*, L.—By streams of the Santa Catalina Mountains.

12. *Panicum Colonum*, L., Sp. Pl., 2nd ed., p. 84.—Santa Cruz Valley, near Tucson.

13. *Panicum Crus-Galli*, L., Sp. Pl., 2nd ed., p. 84.—Santa Cruz Valley, near Tucson.

14*. *Setaria caudata*, R. & S., Syst., ii., 495 ; Vasey, Bot. Wheeler Exped., p. 295 ; *S. setosa*, P.B., var. *caudata*, Griseb., Flor. Br. W. Ind., p. 555.— Pantano, Arizona. June.

15. *Cenchrus tribuloides*, L., Sp. Pl., 1st ed., p. 1,049.—Santa Cruz Valley, near Tucson.

16. *Leersia oryzoides*, Sw., Flor. Ind.Occ., i., 132 (in adnot.).-Santa Cruz River.

17. *Polypogon Monspeliensis*, Desf., Atl., i., 66 ; Gray's Manual, p. 612.—Banks of the Santa Cruz River.

18. *Polypogon elongatus*, HBK., Nov. Gen., i., 134 ; C. Gay, Flor. Chil., vi., p. 301; Steud., Syn. Gram., 183.—Culm simple, erect, geniculate at the lower joints, 2–3 feet high, smooth, 4–5 leaved, the dark colored joints contracted ; sheaths smooth, the lower equalling the upper, shorter than the internodes ; ligule of the upper leaf 2–3 lines long, obtuse, broader than the leaf, and decurrent along the sheath ; leaves broadly linear, smooth below, very scabrous on the margins and on the nerves above (3–4 lines broad, the upper one 6 inches long), involute near the tips, and terminating in a sharp, scabrous point. Panicle ½ to 1 foot long (9 inches in Pringle's specimens), narrow, and rather densely flowered, nodding ; the erect, or somewhat loosely spreading branches in dense, half-whorled clusters, the shorter ones flower-bearing to the base, the longer ones (2 inches long) naked below, much branched, and flower-bearing above the divisions and sub-divisions, being curiously arranged in little fascicles or umbels of threes and fours ; pedicels 2–3 lines long, strongly scabrous, clavate. Glumes empty, slightly unequal, the lower longer, lanceolate, awn-pointed, about 1½ lines, or, including the awn, 2–3 lines long, round and scabrous on the back, aculeolate on the single nerve ; flowering glumes ½ as long as the empty glumes, thin, oblong, broadly obtuse or truncate and irregularly 5-toothed at the tip, with a slender, straight, scabrous awn on the back, above the middle, about 1 line long ; palea half as long as its glume, irregular at the broad truncate tip.

By streams of Santa Rita Mts., Arizona. (467.)

Both Gay and Steudel make *Nowodworskia agrostoides*, Presl., Rel. Haenk., i., t. 40, a synonym of this. There is a single specimen of the same species without name in herb. Acad. Phil., collected by C. Mohr in Mexico. On the ticket is written: "near *Muhlenbergia distichophylla*, says Thurber." So far as I know, this plant has not before been recorded as growing within our limits.

19. *Hilaria cenchroides*, HBK., Nov. Gen., i., t. 37 ; Vasey, Bot. Wheeler Exped., p. 281.=*Scleropelta stolonifera*, Buckley, in herb. Acad. Phil.—Mesas, near Camp Lowell. July.

No. 846 of E. Hall's Texan plants is the same.

F. Lamson Scribner.

Notes on the Trees of the South-west.*—*Quercus Emoryi*, Torr., known as the "black oak," is very common in the country of the Upper Gila. It never grows on the hills, nor far from the beds of the streams, though these may be dry during the greater portion of the year. It delights in a fine gravelly, or sandy soil in open cañons. Although the growing wood is not subject to decay, as is the case with the other oaks of this section, I do not know that it is highly esteemed. It is here a tree 40 or 50 feet in height, and proportionately stout. Its thick, dark, and glossy foliage would make it a very handsome tree, but for the scraggy appearance given it by its dead twigs and branches. Its acorns furnish the principal September food supply of large flocks of wild pigeons.

Quercus hypoleuca, Engelm.—This handsome little tree I have observed in the Bear Mountains. It scarcely exceeds 15 feet in height, the trunk being stout for the size of the tree. Its long, elegantly pointed, dark green leaves, silvery below, render it handsome in spite of its gnarled and twisted trunk and branches. It grows only in deep cañons, and in the rockiest places. It would be a great favorite as an ornamental tree in those sections where it could be successfully cultivated.

Quercus undulata, Torr., grows sparingly in the Bear and Burro Mountains, and very abundantly in the Mogollon Mountains, where, with the sycamore, it forms about five-sixths of the tree-flora of the cañons. The young wood is quite tough and strong; but, as it grows older, it soon becomes brittle and subject to decay. The trunks and main branches, like those of *Platanus*, are much twisted, and bent or arched. It grows only in the bottom of the cañons.

Quercus grisea, Liebm.—This is comparatively a rare tree in the sections which I have visited. A few trees grow in the San Francisco Mountains, and it is rather frequent in the Bear Mountains. Its smaller leaved forms approach the next species in appearance, but it seems to be distinguished from that by its more abrupt manner of taking on fresh foliage; while in the color and appearance of its bark, and the habit of the tree, it is much like *Q. hypoleuca*. I did not see the fruit.

Quercus pungens, Liebm.—I am somewhat in doubt as to whether the plants which I have called by this name do not constitute two species, one a good-sized tree, the other shrubby. This tree, if we include its shrubby forms, is probably more abundant than any other in the basin of the Upper Gila, and the adjacent country. It does not grow upon the plains, but is everywhere abundant in the mountains. It clothes many of the gravelly hills, from base to summit, with a dense thicket of scraggy growth. On the higher summits it is not common, while in partial shades in the cañons and near water, it becomes a good-sized, though rather low tree. Its form is strikingly like that of a well-grown apple-tree; and a gentle slope, or grassy hollow dotted with good-sized, scattered specimens reminds one strongly of a New England orchard, and is a sight which a lover of fine trees delights to look upon. Probably no tree is more generally unsound at the heart, yet one must be experienced to detect the indications of such a state. It is difficult to find a sound specimen, except where the roots have access to a permanent water-supply, and then only among young trees.

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*Continued from page 53. In making up the April number of the BULLETIN, Mr. Rusby's name was accidentally omitted from his communication, and the omission was overlooked by us till it was too late to rectify the error.—ED.

Alnus oblongifolia, Torr.—With the exception of the Coniferae, this occasionally becomes the largest tree of the South-western Rocky Mountain region, though the average size is less than that of the next. It is common and abundant along nearly all mountain streams, growing only at the very edge of the water. It is well-proportioned and handsome. The wood is brittle, decays rapidly, and is fit only for firewood.

Populus Fremontii, var. (?) *Wislizeni*.—A magnificent tree, abundant along all streams in the open country, or in the open parts of the cañons. Toward the heads of the cañons, or where they are narrow and precipitous, it is rarely found. Like other cottonwoods, this species flourishes where no others grow, and is hence one of the most valuable trees.

Juniperus occidentalis, Hook., var. *monosperma*, Engelm.—One of the most abundant trees of Southern New Mexico, growing occasionally in cañons, but mostly on low hills with the next, and with *Pinus edulis*, these three species constituting almost the entire tree-flora of the hilly country. It becomes something more than a "small tree," though it is never tall. In some sections it is almost the only tree.

Juniperus pachyphloea, Torr.—Everywhere abundant in the mountains and hills. The large, sweet fruit is extensively eaten by bears and coyotes, and, I believe, by foxes (!) and deer.

Cupressus Arizonica, E. L. Greene.—This fine tree I have seen only in the San Francisco Mountains, where it is quite abundant, growing both in cañons and upon the highest mountains, on the northern slopes. Where it grows in thick patches, it becomes tall and straight, much resembing, at a distance, the balsam fir. Single specimens branch widely, and assume handsome forms. The largest that I have seen measured about forty inches in diameter. It possesses great value as a timber-tree, being evidently adapted to varying conditions of soil and climate, the wood being light, strong, straight-grained, and apparently durable. Its handsome form and color, and the sprightly disposition of its foliage would render it a favorite upon the lawn. Growing upon so limited an area, in a lively mining district, where great numbers of the trees are being continually cut for fuel, both as wood and charcoal, it is not sufficiently protected, and it is strongly advisable to introduce it into other sections.

Pseudotsuga Douglasii, Carr.—The principal species constituting the large and dense forests which clothe the higher portions of the Mogollon Mountains. In the deep and shady cañons it descends almost to the base of the mountains, the largest specimens growing in such locations. Unless two species have been observed, two distinct forms grow here, one with the very glaucous leaves shorter and more rigid and crowded. The bark of the latter is thicker, and is more deeply furrowed than in any other species with which I am acquainted.

Pinus reflexa, Engelm.—Seen only in the higher portions of the Mogollon Mountains, where it grows sparingly. The trunk is tall, slender, crooked, and very flexible, with a few branches at the top. The large, somewhat flattened seeds are fully as sweet and rich as those of *Pinus edulis.*

Picea Engelmanni, Engelm., grows sparingly in the Mogollon Mountains, and only on the highest summits. It forms a compact and handsome top.

Ephedra antisyphilitica, C. A. Meyer, becomes a small tree of 12 or 15 feet in height, and 5 or 6 inches in diameter, along the Rio Grande. It is apparently worthless.

HENRY H. RUSBY.

Contributions toward a List of the State and Local Floras of the United States.

III. THE SOUTH-EASTERN STATES.

Manual of Botany adapted to the productions of the Southern States. By John Darby, A.M. (D.)
12mo., 612 pp. Macon, Ga., 1841, and New York, 1866.

Musci Alleghanienses, sive spicelegia Muscorum atque Hepaticarum quas in itinere a Marylandia usque ad Georgiam per tractus montium, A. D., 1843, decerpserunt Asa Gray et W. S. Sullivant. By W. S. Sullivant. (C.)
12mo., 87 pp. Columbus, Ohio, 1846.

Flora of the Southern United States, containing abridged descriptions of the flowering Plants and Ferns of Tennessee, North and South Carolina, Georgia, Alabama, Mississippi and Florida. By A. W. Chapman, M.D. (D.)
8vo., 621 pp. New York, 1860.

Enumeration of the species issued in the first and second centuries of Ravenel's "Fungi Caroliniani Exsiccati," with other species collected at the same time in insufficient quantities for distribution. By M. C. Cooke. (C.)
In Grevillea, Vols. vi and vii. London, 1877–'79.

VIRGINIA.

Flora Virginica, exhibens Plantas quas v. c. Johannes Clayton observavit atque collegit. Easdem methodo sexuali disposuit, ad genera propria retulit, nominibus specificis insignivit minus cognitas descripsit Joh. Fred. Gronovius. (D.)
8vo., pp. 206. Leyden, 1739–1743.

Catalogue of Plants observed by John Bannister in Virginia. (A.)
In Ray's Historia Plantarum, Vol. ii. London, 1688.

WEST VIRGINIA.

Flora of West Virginia. By H. N. Mertz and G. Guttenberg. (A.)

List of Timber Trees of West Virginia. By J. H. Diss Debar. (B.)
In Handbook of West Virginia.

Forest Trees, Shrubs and medicinal Plants of West Virginia. By W. M. Fontaine. (B.)
In Resources of West Virginia, p. 111. Wheeling, 1876.

List of medicinal Plants growing in West Virginia. By Dr. A. S. Todd. (A.)
In Trans. Med. Soc'y of W. Va., for 1867 and 1871.

NORTH CAROLINA.

Catalogue of the indigenous and naturalized Plants of the State. By M. A. Curtis. (B.)

In Geol. and Nat. Hist. Survey of N. C., Part iii. Raleigh, 1867.

Synopsis Fungorum Carolinae Superioris. By L. D. De Schweinitz. (C.)

In Acta Soc. Nat. Cur. Lips. Leipzig, 1822.

List of Trees of North Carolina. (B.)

In Report on Forestry, pp. 471–477. Washington, 1879.

Report on the woody Plants of North Carolina. By M. A. Curtis.

In Geol. and Nat. Hist. Survey of N. C. 1860.

Jones County.

Catalogue of Plants observed in the neighborhood of Newbern. By H. B. Croom and H. Loomis, M.D. (A.)

8vo., pamphlet, pp. 52. Newbern, 1883.

Catalogue of the Plants, native or naturalized, in the vicinity of Newbern. By H. B. Croom. (A.)

8vo. pamphlet, pp. 52. New York, 1837.

New Hanover County.

Enumeration of Plants growing spontaneously around Wilmington N. C. By M. A. Curtis. (A.)

In Journ. Bost. Soc. Nat. Hist., Vol. i. 1834.

SOUTH CAROLINA.

Sketch of the Botany of South Carolina and Georgia. By Stephen Elliott. (D.)

2 vols., 8vo., pp. 606 and 744. Charleston, 1817–1824.

Notes on the Marine Algae of South Carolina and Florida. By J. Cosmo Melvill. (C.)

In Trimen's Jour. Botany, Vol. iv. (new series), p. 258. London, 1875.

Flora Caroliniana. By Thomas Walter. (D.)

8vo., pp. 263. London, 1787.

Charleston County.

Catalogue of phaenogamous Plants and Ferns, native or naturalized, found growing in the vicinity of Charleston. By J. Bachman. (A.)

Pamphlet, pp. 15. Charleston, 1834.

Catalogue of the Natural Orders of Plants inhabiting the vicinity of the Santee Canal, S. C., as represented by Genera and Species. By H. W. Ravenel. (A.)

In Proc. Am. Assoc. Adv. Sci., Vol. iii. 1850.

A Medico-Botanical Catalogue of the Plants and Ferns of St. John's Berkly, S. C. By F. P. Porcher. (B.)

8vo., pamphlet, pp. 54. Charleston, 1847.

Richland County.

Catalogue of the Plants of Columbia and its vicinity. By Lewis R. Gibbes.

Pamphlet. Columbia, 1835.

GEORGIA.

Cherokee County.

A List of Plants found in the neighborhood of Counasaga River, where Spring Place is now situated. By Mrs. Gambold. (A.)

In Amer. Journ. Sci. and Arts., 1 series, Vol. i. 1818.

FLORIDA.

A Catalogue of a Collection of Plants made in East Florida during the months of October and November, 1821, by A. Ware. By Thomas Nuttall. (C.)

In Am. Journ. Sci. and Arts., 1 series, Vol. v. 1822.

List of the Plants growing spontaneously in the vicinity of Quincy, Fla. By A. W. Chapman, M.D. (A.)

In Western Journ. Med. and Surg., Vol. iii. (new series), 23 pp. Louisville, Ky., 1845.

List of the Marine Algae collected by Dr. Edward Palmer on the coast of Florida and at Nassau, Bahama Islands, March–August, 1874. By D. C. Eaton. (B.)

8vo., pamphlet, pp. 6. New Haven, 1875.

An enumeration of some Plants, chiefly from the semi-tropical regions of Florida, which are either new, or which have not hitherto been recorded as belonging to the Flora of the Southern States. By A. W. Chapman, M.D. (D.)

In Botan. Gazette, Vol. iii. Logansport, 1878.

Ferns of South Florida. (With notes on the species.) By A. P Garber.

In Bot. Gazette, Vol. iii. Logansport, 1878.

W. R. G.
N. L. B.

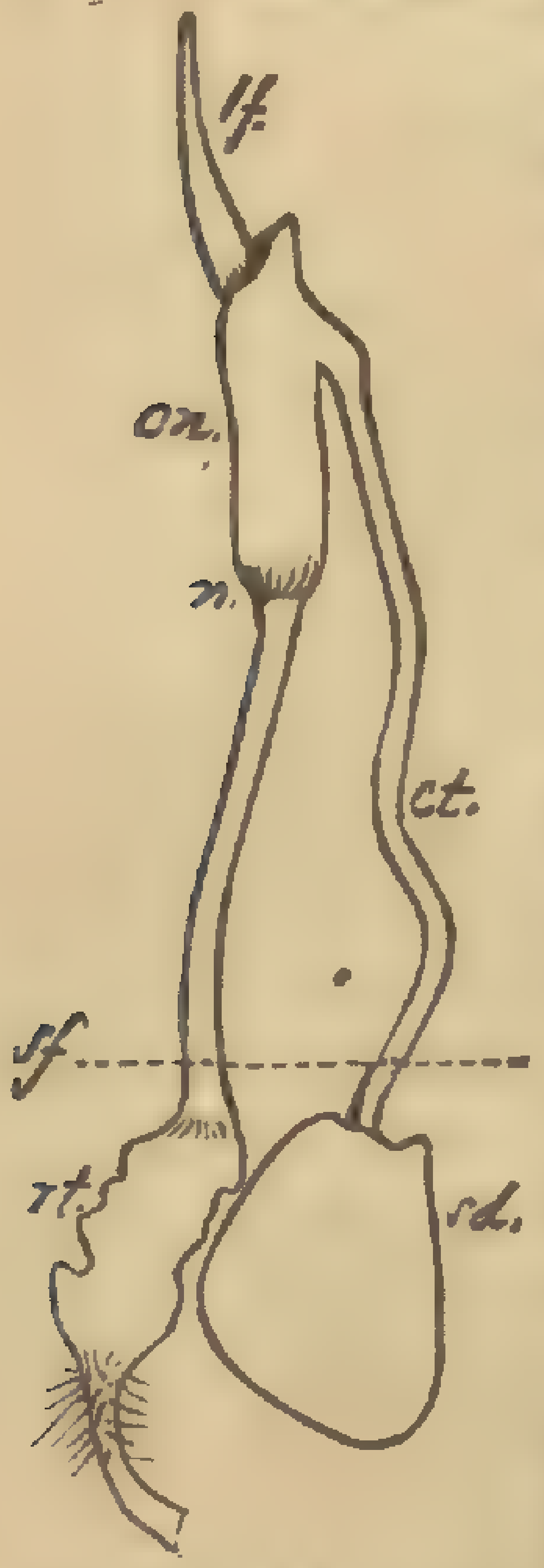
The brittle Branches of Salix sericea, Marshall.—Has any one examined critically the "brittleness at the base" of the branches in this willow, of which our text-books tell us? It seems phenomenal, though akin to the articulation we find in *Ampelopsis*, *Taxodium*, *Thuja* and some others at the fall of the year. Here is a branch so tough that we may use it like twine, and which separates as easily. by a light tug, as we pull a feather from a bird! It is not really "brittle at the base," for the base must mean either exactly at the junction with the parent stem, or some indefinite point above. But the point of separation is a little above the true "base," and always just at this point, barely a hair's breadth in width; and the breakage is always in a true circle around the stem. It is evidently not a species of "brittleness" so much as a case of specific, incipient articulation.

THOMAS MEEHAN.

A Suggestion.—Errors in the description of plants occur here and there in our Manuals of Botany, owing for the most part, no doubt, to the tendency of some species to vary from the typical form. But it is surprising that there should be so great a discrepancy in the diagnosis of *Carex Novae-Angliae* and *C. Emmonsii* so far as the color of their spikelets is concerned. Both Wood and Gray state that the former has purplish spikelets and the latter green ones; whereas the reverse seems to be the rule. Out of a large number of specimens of *C. Novae-Angliae* received from the mountains of New York, Vermont, New Hampshire and Massachusetts not one so much as suggests a purplish spikelet. On the other hand, *C. Emmonsii* always shows scales more or less purplish. Admitting that the persistent style of the former is sufficient to distinguish it from the jointed style of the latter, is there not still good ground for suggesting a change in the description of these two species?

Yonkers, N. Y. E. C. Howe.

Germination of Iris versicolor.—The accompanying figure illustrates a peculiar mode of germination that I have observed this spring in *Iris versicolor*, the seeds of which I had planted in a flower-pot kept in a rather warm place in the house. The descriptions and figures of the germinating seed of *Iris* which I have seen thus far (cf. Gray, Structural Botany, p. 24, fig. 55) do not agree with my observations, for I do not find mentioned and illustrated in them the long, filamentous connective (*ct*) between the endosperm of the seed (*sd*) and what I must call the cotyledon (*cn*).



The whole process reminds one very much of the germination of *Phoenix dactylifera* (Sachs's Botany, Eng. edit., 1875, p. 542, fig. 388), but in the case of the *Iris* the connective is much longer in proportion, and rises, with the first node (*n*), and the first leaf (*lf*), from one-half to three-fourths of an inch above the surface (*sf*), while the seed (*sd*) stays behind under ground.

It would be worth while to ascertain whether this mode of germination is common with *Iris versicolor*, or whether, as I suppose, it is abnormal—caused perhaps by the more rapid growth at a higher temperature.

Hoboken, N. J., April, 1882. Joseph Schrenk.

New Station for Corema Conradii, Torr.—Learning that *Corema Conradii*, Torr, had been found on Shawangunk Mountain, Ulster Co., N. Y., I went there on the 2d of May to seek it. I found it growing on the crest of the ridge, in a bleak spot not sheltered by trees; quite plentiful there, but not seen elsewhere, for the two miles that I looked for it.

It is a low bush, much branched, spreading, almost prostrate, with erect branches, about 9 inches high, and 20 inches wide across the branches, from out to out.

It is described as dioecious or polygamous. I got 85 specimens, of which were dioecious, 84; monoecious, 1; polygamous, 0.

The monoecious specimen had 30 clusters of pistillate flowers near the top, and one cluster of staminate near the base: total clusters on the specimen or branch, 31. I saw no other flower in bloom, on the mountain. I found a small form of *Asplenium montanum*, Willd., from one to one and a half inches high.

The day was cold, with a high wind and heavy squalls of snow and rain. In some sheltered places, last winter's ice was not all gone. The height of the ridge is about 1,800 feet above tide-water. It was too early for the regular spring flowers in so elevated and exposed a place. I was under the impression that the plant was strictly dioecious, and therefore did not look for polygamous or monoecious plants. The collection of one of the latter, was purely accidental, and was not observed until I got home. A more careful examination on the spot, may show that monoecious and polygamous forms are more common than I found them.

216 So. 15th Street, Philadelphia. CHARLES E. SMITH.

Notes from Massachusetts.—During the present spring I have examined a large number of the plants of *Symplocarpus foetidus*, Salisb., with a view to observing malformations, with the following result. More than a dozen spathes were found which contained a second spathe within the outer one. Their relative positions varied. In some specimens the inner spathe opened in the same direction as the outer, in others it faced directly opposite, and in others it occupied intermediate positions between these. Each specimen contained a perfect spadix. All the spathes in one cluster (8) presented this change. Several specimens were found which were perfectly normal with the exception that the spadix was abortive, very minute and imperfect. One had no trace whatever of a spadix. Incidentally it was noted that the flowers were much frequented by our common honey-bees. Indeed, with one or two accidental exceptions, I have noticed no other insects about them.

Prof. Bailey's observation on the lack of male flowers in the alders this spring finds abundant confirmation in this locality. The peculiar season seems to have worked confusion among our spring flowers. The rare *Nardosmia palmata*, Hook., found at a single station in this region, has this season almost wholly failed to put forth flowers. Not half a dozen specimens have been collected where usually hundreds are found, although quantities of the palmate leaves testify to the vitality of the roots.

Amherst, Mass., May 5th, 1882. WINTHROP E. STONE.

The Alder Catkins.—On page 57 of the BULLETIN I see a note on alder catkins, and would like to say that the staminate catkins of that plant, in this vicinity, this year, were remarkably vigorous, and appeared in great profusion. I noticed this fact from my attention, for special reasons, having been given to them. I should reasonably expect there might be all this difference in places so distant from each other as Rhode Island and Wisconsin.

Ripon, Wisc. C. T. TRALEY.

Plant Exchanges.—Dr. Joseph V. Haberer, of 66 Miller Street, Utica, N. Y., who is constantly engaged in collecting, and who has good specimens of everything found growing in Oneida County and vicinity, desires to correspond and exchange with botanists devoted to the study of *Carex*. Dr. Haberer's list of desiderata is too long to insert in this place, but may be obtained by addressing him as above.

Mr. Gustav Adolf Zwanziger, the editor of the *Kärntner Gartenbauzeitung*, and whose address is Klagenfurt, Kärnten, Austria, writes us that he would like to exchange phaenogams and cryptogams of the Austrian Alps for American ferns, mosses, algae and phaenogams.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. IX.] New York, July, 1882. **[No. 7.**

William Henry Leggett.

The decease of the late Editor of the BULLETIN calls for more than the passing notice which it has received in its columns. Mr. Leggett was born February 24th, 1816, and died on the morning of the 11th of April, 1882. Always a hard student, he graduated from Columbia College in 1837. Previous to that event he had already devoted himself to teaching—a calling which he pursued throughout life. By means of the kindliness of his disposition he endeared himself to his pupils and led them on to regard the pursuit of knowledge as a pleasure instead of a task, and to aim at the attainments in classical knowledge which he himself possessed.

The following extract from a letter of one of his former pupils fitly illustrates the thoroughness which he always endeavored to instil into the minds of those committed to his charge: "How many there are of us all over the country who took from him our first lessons in accurate scholarship!"

He early became enamored with the study of botany, and the same feeling of thoroughness in his investigations of plant life exhibited itself in this as in his other studies. He was one of the founders of the Torrey Botanical Club, whose resolutions passed on the event of his decease express their sense of his scientific attainments and of his efficiency as a leader and co-laborer with them. His labors as the first Editor of the BULLETIN which was started by him as a private enterprise in 1870, and conducted as such until the year 1880, can, perhaps, only be fully appreciated by those who have had to perform similar work in the midst of other pressing duties. Day by day, following his occupation as an instructor with conscientious fidelity, he yet found time, too often taken from hours of needed rest, to write, collate and arrange for the press the matter of his journal. His success in the performance of his work was complete, but the harassing nature of his daily duties, and his failing strength finally compelled the relinquishment of its charge to other hands.

His private character was above reproach. Upright, conscientious and fearless, he was prompt to denounce wrong in every shape; yet was always considerate and charitable towards the short-comings of others. In his social relations, his purity of character, his self-sacrificing spirit, his integrity and kindliness of disposition endeared him to all.

The following extracts from letters written by those who had enjoyed his society for years show the cordial esteem in which they held him. One says: "I can hardly call to mind a single man that I have known with whom all my intercourse was so sweet and delightful as with him; * * * he was so sincere and guileless, so cheerful and bright." From another: "My botanical tramps with him always had a classic seasoning—Greek as well as Botany—which made them doubly enjoyable; while his genial charity toward all men was a pattern and delight." And from one other: "We had been friends for more than forty years * * * a more pure-minded and true-hearted man I have never known. * * * The world has lost in him a profound classical scholar, a most conscientious teacher, and an enthusiastic botanist."

We shall close this brief biographical notice with one more extract from a letter of this old friend, touching in its sadness: "Our dear departed friend has left an aching void in the hearts of all who knew him, so kindly disposed and sincere in his affcctions he was, while gifted with extraordinaty powers of promoting innocent mirth and true sociality. One cannot expect to meet with many such in a lifetime. Would he had been spared to us many years longer. I little thought I should outlive him."

T. H.

A New Species of Dichromena.

By S. H. WRIGHT.

DICHROMENA REVERCHONI.—Culm nearly terete, smooth, slender, caespitose, four to nine inches high; leaves very narrow, smooth, acute, almost capillary, those of the culm 1½ to 2½ inches long; radical leaves 2 to 5 inches long, erect or falcate and spreading; involucre of two slender, unequal, acute bracts, dilated and whitened at the base, the longer being about 1 inch in length, and the shorter from ¼ to ½ inch long; spikes 4 to 6, and ⅛ to ¼ inch long, terminal, sessile, glomerate, scales variable, acute, obtuse, truncate, or even emarginate in the same spike, and *keeled*, *white*, with more or less ferruginous lines at the base when mature; achenia dull, strongly rugose, round-obovate, very convex, the dilated base of the short-beaked, compressed tubercle, decurrent on both edges to and around the base of the nut, giving it an annulated appearance there.

This species was discovered in 1879, and in one place only, by Mr. Julien Reverchon in a little swamp watered by a spring in limestone rocks, near Turtle Creek, Dallas County, Texas. and near Dallas. It flowered in June. Specimens collected in 1880, in flower only, were sent to me. A very few in fruit, collected in 1881, were obtained, from which the above description is given.

A List of Grasses collected by Mr. C. G. Pringle in Arizona and California, with descriptions of those species not already described in American Publications.*

20. *Hilaria rigida.* (*Pleuraphis rigida*, Thurber, Gram. Mex. Bound. ined.; Bot. Cal., ii., p. 293.)—Yuma, Arizona. June 25.

See note under "Change of Name" in March number of the BULLETIN.

21. *Imperata caudata*, Trin., Sl., t. 70, f. 1; Griseb., Flor. Br. W. Ind., p. 561; *Imperata arundinacea*, Vasey, in Bot. Wheeler Exped., p. 296.

Culms erect, terete, smooth, clothed at the base with numerous dry and distichous sheaths, 3 feet and more high; leaves, excepting the upper ones, which are short (1–2 inches), very long (1 foot and more) flat, rather stiff or rigid, 4–6 lines wide, above much narrower, and more or less conduplicate below, margin with a narrow, minutely serrulate, cartilaginous line, apex long-acuminate, with a sharp, stiff point; ligule short, long pilose. Panicle (in specimens in hand) 6–8 inches long, narrow (½–1 inch), very woolly, and densely flowered; lower branches erect, 1½ inch long. Spikelets in pairs (single above), the pedicel of one about one line long, that of the other one-half shorter, densely pilose at the base with long (3–4 lines) silvery-white, silky hairs, with similar hairs on the outer surface of the empty glumes. Empty glumes sub-equal, the upper and larger one 1½–2 lines long, both 5- or imperfectly 7-nerved, with broad, obtuse, erose or finely ciliate tips, and enclosing three hyaline scales appearing like lodicules; the outer one, which is supposed to represent a neutral floret without a palea, is lanceolate, obtuse and finely cut at the tip, nearly as long as the empty glumes; the second, supposed to be the fertile glume (lower palet), is like the first, excepting that it is a third smaller; the third scale, supposed to be the palea of the perfect flower, is about ⅔ of a line long and fully as broad, irregularly and deeply cut-toothed at the tip (sometimes almost regularly 3–5 toothed). This scale surrounds the ovary and the one stamen.

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* Continued from page 77.

By streams, Santa Catalina Mts. June. It is the same as No. 283 of Drummond's Texas coll. (vid. herb. Philada. Acad.)

22. **Heteropogon contortus*, R. & S., Syst., ii., 836.
= *H. hirsutus*, Pers., Syn., ii., 533.
= *Andropogon contortus*, L. Vasey, in Bot. Wheeler Exped., p. 296.

Santa Cruz Valley, near Tucson. (459.)

23. **Heteropogon contortus*, R. & S., var.—Differs from the last only in having the outer glume of the male flower smooth (not at all pilose), and with but a very narrow-winged, scarious margin. It agrees with descriptions of *Heteropogon Alionii*, R. & S. (*H. glabrum*, Pers.), but it seems too near *H. contortus* to be separated from it.

Mesas, near the Santa Rita Mts., Arizona. (460.)

24. **Andropogon Jamesii*, Torr., in Marcy's Rep. (1852.)
= *A. glaucum*, Torr., in Ann. N. Y. Lyc., i., p. 153 (1824.)
= *A. Torreyanus*, Steud., Syn. Gram., p. 392 (1854.)

Santa Cruz Valley, near Tucson. (453.)

Equals No. 845 of E. Hall's Texan Plants; No. 3,635* Curtiss's Distrib. N. Am. Pl.; and No. 582 of Brandegee, collected near Cañon City, Colorado, referred to *A. argenteus*, Ell., in Flor. Colorado. This grass is very closely allied to *A. saccharoides*, Sw. (vid. Griseb., Flor. Br. W. Ind.), and perhaps should be united with it.

25. **Phalaris intermedia*, Bosc., in Poir. Encycl. Suppl., i., 300; Chapman's Flora of the Southern States, p. 569.

Santa Cruz Valley, near Tucson. May.

26. **Aristida Americana*, L., Am. Acad., v., 393.
= *A. dispersa*, var., Trin. & Rupr.

= *A. bromoides*, HBK. Thurber, Bot. Cal., ii., p. 298.

Mesas, near Camp Lowell. (470.)

A very variable species, of which there are two forms in the collection; one with upright culms about 7 inches high, with the branches of the panicle short and erect; the other with more or less geniculate culms, 18 inches high, with the panicle more open (the lower branches being from 2–3 inches long and more or less spreading) resembling in habit *A. caerulescens*, Desf. The first form is the more common in collections from the West, and is that described by Dr. Thurber in Bot. Cal., ii., p. 289, under the name of *A. bromoides*, HBK. The different forms of this species, of which the *A. bromoides*, HBK., is one, were all united by Trinius & Ruprecht under their *A. dispersa*. Genl. Munro, in his catalogue of the grasses in the herbarium of Linnaeus, says that *Aristida Americana.*, L., from Jamaica, "is called *A. dispersa* by Trinius; but Linnaeus's name ought to take precedence. Kunth has misplaced the Linnæan synonym in *Eutriana juncifolia*." Grisebach, in Flora of the British West Indies, unites *A. Americana*, L., *A. dispersa*, Trin., *A. bromoides*, *humilis* and *coarctata*, HBK., and *A. cognata*, Trin., under *A. stricta*, Michaux.

27. **Aristida Humboldtiana*, Trin. & Rupr., Stipac., p. 118; Vasey, Bot. Wheeler Exped., p. 286; *A. divaricata*, HBK.

Mesas, near Camp Lowell. June.

28. *Stipa occidentalis* (?) Thurber, Bot. Wilkes's Exped., p. 483; Bot. Cal., ii., p. 285.

Mt. Shasta, California; alt. 7,000 feet. August. Pringle's specimens differ from the description of this species in Bot. Calif., and from specimens in herb., in their more slender and wiry habit, extremely short ligule, both empty glumes 3-nerved, smaller, shorter and less hairy flowering glume, and the proportionately shorter pale. It seems to be a form intermediate between *S. occidentalis* and *S. Sibirica*, Lam. It differs from the latter species in its narrow leaves, and more plumose and twice geniculate awn. It appears to be nearer *S. occidentalis*, and may be, as Dr. Vasey suggests, a depauperate form of that species.

29. *Muhlenbergia comata*, Benth. *Vaseya comata*, Thurb., Proc. Phil. Acad., 1863, p. 79; Bot. Cal., ii., p. 278.

Mt. Shasta, California; alt. 6,000 feet. August.

30. *Muhlenbergia Texana*, Thurber, Gram. Mex. Bound., ined.; Porter and Coulter, Synop. Flor. Col., p. 144.

Mesas and foot-hills, near Tucson.

31. *Muhlenbergia distichophylla*, Kth., Enum. Pl. i., p. 202; Vasey, in Bot. Wheeler's Exped., p. 283; *Podosaemum distichophyllum*, Presl., in Rel. Haenk., i., 231.

Cañons, Santa Catalina Mts. May.

32. **Muhlenbergia virescens*, Trin., Unifl., 193; Kunth, Enum., Pl., i., 202., et Suppl., 160; *Podosaemum virescens*, HBK., Nov. Gen., i., 132; *Trichochloa virescens*, R. & S., Syst., ii., 389.

Culms slender, 2 feet high, simple or branched at the base, smooth. Leaves narrow and involute, the upper about one foot long, nearly equalling or slightly exceeding the culm. Ligule 6 lines long. Panicle 6 inches long, the erect branches single, or the lower in pairs, densely flowered nearly or quite to the base Empty glumes lanceolate, pale straw-colored and sometimes tinged with purple, the upper 3-nerved, mucronate and often 3-toothed at the tip, 2½ lines long, one-half a line longer than the acute, one-nerved lower glume. Flowering glume 2 lines long, pilose below on the back, and for nearly ⅔ its length on the margins, terminating in a slender awn 6–10 lines long; palea nearly as long as its glume and similarly pilose. Stamens 1½ line long, pale purple.

This species resembles *M. gracilis*, Trin., in habit, but is distinguished at once by its very long involute leaves and light colored, more loosely flowered panicle.

Summits of the Santa Rita Mts., Arizona.

This is a Mexican grass, not before observed in the distributed collections made within the limits of the United States, and perhaps now found for the first time within our limits. It should be added that identification of Pringle's specimens with *M. virescens*, Trin., is based upon descriptions of that plant only.

33. **Muhlenbergia debilis*, Trin., Agrost., ii., 49; Thurber, Bot. Cal., ii., p. 277; *M. purpurea*, Nutt., Pl., 180.

Foot-hills, Santa Catalina Mts. April.

34. *Muhlenbergia sylvatica*, Torr., var. *Pringlii* (vel *n. sp.*)—Culms densely caespitose, terete, erect, simple, rather rigid, about 1 foot high. Leaves involute, filiform, about 7 to each culm, minutely scabrous outside, especially towards the tip, strigose scabrous within, 4–6 inches long, the lower ones shorter; ligule broader than the leaves, decurrent along the sheath, ½ line long, irregularly cut, continued on each side into two lanceolate, acute teeth or auricles one line long. Panicle slender, contracted, 2–3 inches long, rather densely flowered. Empty glumes nearly equal, 1-nerved, with slender acuminate points, 1 line long. Flowering glume nearly or quite smooth at the base, 3-nerved, scabrous on the keel above, 1½–2 lines long, terminating in a slender awn 4–6 lines long; palea nearly equalling its glume.

Dry Cliffs, Santa Rita Mts.; alt. 7,000 feet. July. (480.)

The specimens are not mature, but are developed sufficiently to show the above-enumerated character. Later, the panicle, the base of which is enclosed in the upper sheaths, may become exserted, and the culms, though now strictly simple, may become branched. It is referred to *M. sylvatica* because of the resemblance of the panicle and minute characters of the spikelets to that species. It is distinct from No. 731 of C. Wright's Texan coll., called *M. monticola* by Buckley, and referred to *M. sylvatica* by Munro.

Girard College, Philadelphia. F. Lamson Scribner.

The Brittle Branches of Salix were recently referred to by Mr. Thomas Meehan. Ordinary wood-cells are long, and possess tapering extremities which overlap each other. This overlapping occurs all along the wood, about as much in one place as in another. In brittle willows the cells mostly end abruptly at the place where the branch snaps off. At first thought, this might seem to be a defect in the structure of the plant. Notwithstanding this peculiarity, such trees produce branches enough. The wind, weight of snow or other forces frequently bring down the young branches. The trees mostly grow in moist soil, frequently near streams. These branches may take root in the soil where they drop, or be carried down stream by the current and lodge on the shore below. With this view, the brittleness is a very effectual means of multiplying and distributing the species. Analogous examples are not uncommon. The fleshy buds in the axil of the leaves of the tiger-lily separate spontaneously and produce independent plants where they fall in suitable places. *Sempervivum globiferum* produces some slender branches a foot or more in length, and these bear a couple of small thick leaves at the end, within which are rudiments of other leaves. These leafy tips spontaneously separate and produce new plants where they strike soil. If my memory is not at fault, the slender branch then dies, as is the case with the runner of a strawberry after it produces a new plant at the end. Doubtless many similar examples are familiar to most botanists and horticulturists.

Michigan Agricult. College, Lansing. W. J. BEAL.

Brittle Branches of Salices.—In the June number of the BULLETIN Mr. Thomas Meehan has opened a subject of considerable interest. Several of the willows (especially old trees) beside *Salix sericea* have branches brittle at the base, or rather which semi-articulate above their true base. This I have noticed for years in *S. sericea* and in *S. Babylonica*, but supposed it was a case of true brittleness as set forth in our manuals.

E. C. HOWE.

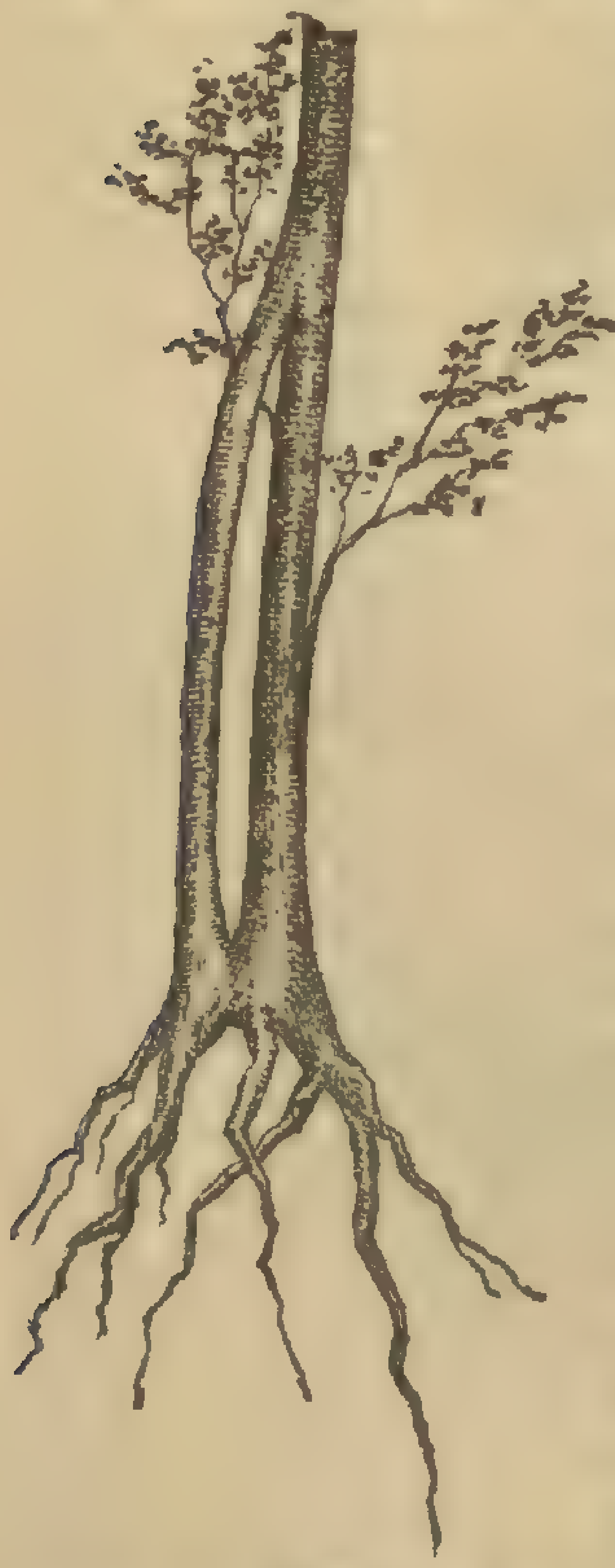
Dicentra Canadensis.—Since I wrote the note on *Dicentra Cucullaria* for the April number of the BULLETIN, I have had occasion to examine the "tubers" (as they are called in our manuals) of *D. Canadensis*, and have found that they, too, are simply very much enlarged petiole-bases. There are also some very minute, abortive leaves formed at the base of the fully developed leaves, but they do not grow into small bulblets as in *D. Cucullaria*, and therefore this species has no bulb-like rootstock; but the large, round bulblets are scattered singly on the more or less elongated, thin, scaly rhizoma. On the top of each, the scar left when the upper portion of the leaf has withered away, is plainly visible.

Hoboken, May, 1882. JOS. SCHRENK.

Multiplication of Spadices in Arisaema.—I have to report a monstrosity quite new in my experience. In my small garden, I have growing a number of wild plants, among them *Arisaema triphyllum* in quantity. The "pulpit" of one of these is occupied by *two* "preachers." To speak after the manner of botanists, there are within the spathe two spadices, confluent only in the lower flower-producing part. The flowers are all pistillate and apparently normal. Of the two "Jacks," one is taller than his clerical brother, while the lesser one is deformed, that is, somewhat flattened below and dilated above. He has a somewhat subdued look beside his more arrogant brother. Dr. Masters mentions cases of double *spathes* in *Arum maculatum*, but I have seen no record of multiplication of the *spadices* in that or any related plant.

W. W. Bailey.

Adhesion between two Beeches.—In the case represented in the annexed cut, reproduced from a drawing sent to the Bulletin by Mr. Arthur Hollick, Nature appears to have executed a species of grafting, akin to that which, in the operations of gardening, is known as "inarching." The figure represents two small trees of *Fagus ferruginea*, Ait., the axes of which, through very close contact, at about five feet above the surface of the soil, have adhered at that point until a perfect union has taken place and the two individuals have become inseparably blended together there into one trunk. The fusion once effected, all traces of the union have become thoroughly effaced through subsequent annual growth. As will be observed, adhesion has also occurred at the bases of the trees.



Examples of this nature are perhaps not quite as frequent as the occasionally figured ones where two contiguous trees of the same species have become united through the cohesion of their branches, the axes preserving their individuality above such point of union.

Those who have taken the trip by stage-coach, from the steamboat landing at the foot of Lake George to Fort Ticonderoga, have perhaps had pointed out to them by the driver at a certain point on the route, an instance of a still more singular sort of adhesion, where two trees of *different* genera—an oak and an elm—are so closely and firmly adherent for about three feet above the ground-line as to form but a single trunk, which is apparently covered by a continuous bark.

The specimen here brought to the reader's attention by Mr. Hollick was detected by Mr. G. M. Wilber, near Pleasant Plains, Staten Island, on the occasion of a field meeting of the Torrey Club; and, after having been hewn down by the only implements available—pocket knives and a geological hammer—was transported with some difficulty to the museum of the Staten Island Natural History Society.

Fern Notes.—Permit me to add to Mr. Davenport's Fern Notes, page 71, May number of the Bulletin, that *Botrychium nudicaule*, L. f., is quite common from Temecula Canon (north of San Diego) to All Saints' Bay in Lower California. I have gathered many specimens of it in various places. It grows on dry ground, usually wherever *Dodecatheon* or *Selaginella* does. The plant is very inconspicuous, and usually springs up and vanishes in less than six weeks.

I also have to add that *Gymnogramme triangularis* has just been gathered by me at Empire City, Nevada, growing along with *Woodsia Oregana* and *Cheilanthes myriophylla*.

Salt Lake City, U. T. MARCUS E. JONES.

Dimorphous Flowers of Menyanthes.—The usual form of *Menyanthes trifoliata* here has the stamens about half the length of the projecting style. In 1872, I found a specimen with short style and long stamens. I have looked for it since in the same locality and elsewhere, but have not succeeded in finding it again. Will some one who has collected the plant say whether both forms are common?

St. Stephen, N. B., June, 1882. J. VROOM.

Note on Tricardia.—I have recently gathered at Empire City, Nevada, Mr. Watson's *Tricardia Watsoni*, Torr. Mr. Watson, I believe, found a single specimen at St. George, Utah, and Mr. Parish found one on the Mojave. I was fortunate enough to secure about six specimens of this extremely rare plant. These nine specimens are, I believe, the only ones known.

MARCUS E. JONES.

Botanical Notes.—*Origin of the name Bonpland.*—The *Pharmaceutical Journal* says: "Mrs. Mulhall, in 'Between the Amazons and Andes,' gives a curious account of the origin of the name of the celebrated botanist, Bonpland. Visiting the house of one of his friends at Corrientes, she came across a manuscript in Bonpland's writing, which begins:—'I was born at Rochelle on August 29, 1773. My real name was Amadé Goryand. My father—a physician—intended me for the same profession. It was on account of my great love for plants that he gave me the sobriquet of Bon-plant, which I afterwards adopted instead of my family name.'"

On the Drying of certain Plants.—The difficulty of drying plants belonging to the natural orders *Crassulaceae* and *Orchidaceae*, and some of those belonging to the *Portulacaceae* is well known, and the knowledge of a remedy to prevent the plants from growing in the drying-paper will doubtless be welcome to those who are preparing herbaria. M. C. Lallemand (*Bull. Soc. Bot.*, p. 192) recommends enclosing the plant to be dried for twelve hours in a wide-mouthed bottle or iron box, and submitting it to the vapor of benzine contained in a small vessel enclosed with it. The plant is thus killed, and the drying takes place rapidly when the plant is pressed in botanical drying-paper.

The Mayflower.—The *Magazine of American History*, in two of its recent numbers, has included among its various archaeological and historical notes one pertaining to botany. In the April number, a correspondent makes inquiry as to the origin of the name "Mayflower" as applied to *Epigaea repens*, and in the succeeding number Dr. O. R. Willis has undertaken to give the desired information. We remember that two or three years ago this same question was discussed by various writers, through the columns of the *New England Journal of Education*, some of these taking the ground that the name was derived from that of the vessel which carried the Pilgrim Fathers hitherward, and others connecting it with the name of the month which the plant bears.

The *Epigaea*, by the way, is known in North Carolina as "crocus." This being the case it is pertinent to inquire what the *Crocus* is called in that State.

The Progress of Botany.—The recently distributed Annual Report of the Board of Regents of the Smithsonian Institution for the year 1880 contains a paper by Prof. W. G. Farlow on the Progress of Botany in 1879 and in 1880. This paper, with similar ones on the progress made in the departments of Astronomy, Geology, Physics, etc., during the same years, forms a continuation of the Annual Record of Science and Industry formerly published by the Messrs. Harper Bros., but discontinued with the volume for 1878.

A forgotten Evolutionist.—In a paper published in the *Archives des Sciences Physiques et Naturelles,* and reproduced in the *Revue Scientifique* of May 27th, the distinguished botanist, M. Alph. De Candolle, gives us, along with a very just estimate of the scientific labors of the late Charles R. Darwin, some pleasant reminiscences of his long personal acquaintance with that naturalist.

M. De Candolle reminds us in this paper of an evolutionist, now completely forgotten, whose name and work he made known to Mr. Darwin on the occasion of a visit which he paid the latter in 1880. This old author was Duchesne, whose Natural History of Strawberries was published in 1766, thus antedating by many years those later writings of Lamarck, which have caused that naturalist to be regarded as the foremost modern originator of the theory of the variation of species. Duchesne, says M. De Candolle, "was a horticulturist and professor of natural history; and his instruction was as varied as solid. The following is the observation of his which is sometimes cited without remarking the originality of the consequences that he deduced from it. Having sown some seeds of the wild wood-strawberry that he had collected about Versailles, he saw, to his great surprise, that the majority of the plants obtained had but a single leaflet instead of the three which usually characterize the leaves of the species. He sowed the seeds of these singular individuals, and they produced the same form, which has since been preserved. Botanists name this new strawberry *Fragaria monophylla.* Duchesne started from this fact, and from others that he had observed, to reason very profoundly on new forms more or less hereditary, and on what may be called species, race or variety. He reckons that many forms designated as species are races, whose origin may be ascertained, or at least presumed, and he lets drop from his pen words that are truly extraordinary for the epoch. Thus, in speaking of the classification of species, genera and families, he says: 'A genealogical order is the only one that Nature indicates, the only one that satisfies the mind; every other is arbitrary and void of ideas.' He even ventures to give a genealogical tree for the strawberry, constructed from such pedigrees as he knew or presumed. This is what ultra-Darwinians are doing at the present day, with the difference that Duchesne had ascertained one of the pedigrees, while they suppose them all from hypothetical views and more or less disputable reasonings. No one paid any attention to the ideas put forth by Duchesne, and to such a point that a conscientious biographer, who pronounced his eulogy in a public assemblage, omitted them entirely."

Botanical Literature.

British Fresh-Water Algae, exclusive of the Desmideae and Diatomaceae. With colored Plates. By M. C. Cooke, LL.D. London: Williams & Norgate. 1882.

Since the publication, in 1852, of Hassall's History of the British Fresh-Water Algae, a work now classed among rare books, and one seldom obtainable, we believe that no other on this subject has appeared in the English language, if we except Dr. Wood's incomplete monograph, which was published by the Smithsonian Institution in 1872.

All students of these plants, then, both English and American, will welcome the Manual which Dr. Cooke is compiling and publishing under the above title. The first part of the work, which has just reached us, is devoted to the *Palmellaceae*, and consists of twenty-eight octavo pages of descriptions in English, with copious notes and observations, accompanied with eleven excellently colored plates. The second part, which is now in course of preparation, will include the *Protococcaceae* and *Volvocineae*, and this will soon be followed by a third part devoted to the *Zygnemaceae*. The author estimates that it will require about twelve parts to complete the work, and these will be furnished at prices varying with the size. Judging from the comparatively low price of the part before us, the cost of the entire work will prove quite moderate, even at the advertised price; yet Dr. Cooke offers the inducement of a discount of 25 per cent. from the latter to those who subscribe now, each part to be paid for as published.

Flora of Westchester County (N. Y.). By Oliver R. Willis, A.M., Ph. D., 8vo., pamph., pp. 56. New York: Roper & Burdge.

During the half century that has elapsed since the publication by the late Dr. S. B. Mead, in the Reports of the Regents of the University for 1831-'32, of a list of plants found growing in the vicinity of North Salem Academy, nothing has been added to our knowledge of the flora of Westchester County, excepting an occasional note in the BULLETIN; and no one had examined the entire region with a view to making a complete report until Dr. Willis was induced to do so by the Rev. Robert Bolton, the author of the History of Westchester County. It was for this work that the Catalogue was especially prepared, and from this that the reprint before us was taken.

According to the author, there have been detected in the County, up to the present time, 1,142 phaenogams and 46 ferns and their allies. Of the phaenogams, 50 are trees reaching a height of 30 feet and beyond; 34 are trees attaining a height 15 to 30 feet; and 69 are shrubs, all of which are growing without cultivation, and very few of which have been introduced. Of the entire number of plants enumerated, 88 are adventive from Europe; and, of these, 57 are found growing without cultivation, and are said to be naturalized, while the remaining 31, although growing without cultivation, can scarcely be regarded as fully established. There is a large number of typographical errors scattered through the pages of this flora, due, as we are informed by the author, to the fact that he was not given a proper opportunity to correct proof. These, however, since the publication of the pamphlet, have been corrected, and a list of the corrections has been printed in the form of an appendix; but we regret to see that even the latter is not free from error, the conceit of the compositor having led him to make a supposed correction of the author's "yellow water-crowfoot" to "yellow-water crowfoot."

A preliminary Catalogue of the flowering Plants and higher Cryptogams growing without Cultivation within thirty miles of Hanover, N. H. By Henry G. Jesup, A.M., Professor of Natural History in the Chandler Scientific Department of Dartmouth College, and the N. H. College of Agriculture and the Mechanic Arts. 8vo., pamph., pp. 52. Hanover, N. H.: N. A. McClary. 1882.

From a typographical point of view, this catalogue presents a marked contrast with the one just noticed, the paper being of excellent quality, and the letter-press of nearly faultless execution.

Prof. Jesup's work is intended to include, so far as known, the flora within about thirty miles radius of the town of Hanover, N. H., a circuit extending to, and embracing the mountain peaks, Moosilauke and Kearsarge in New Hampshire, and Killington in Vermont. The limit embraced is divided nearly equally between the two adjoining States. The total number of plants enumerated is 1,008, of which 956 are phaenogams and 52 are cryptogams. Of the latter, 7 are *Equisetaceae*; 36 (excluding varieties, 6) are *Filices*; and 10 (excluding variety, 1) are *Lycopodiaceae*. The number of introduced phaenogams is 144. The number of additional plants that may be expected to occur within the limits embraced in the flora, and a list of which is given in an appendix, is 146.

As the primary object of this catalogue was the benefit of the author's classes in botany, and of the public at large, brief directions have been given for the collection and preservation of plants; and common names have been added so far as known. The latter differ in no case from those found in all our manuals.

To the catalogue of plants is appended a 22-page list of the vertebrate animals found within the same limits.

The Thirteenth Annual Report of the American Museum of Natural History, Central Park, New York, Feb., 1882. 8vo., pamph., pp. 28.

Of botanical interest in this Report is the following statement: "An herbarium of North American plants, preserved with remarkable taste and care, has been received from the late Stephen Whitney Phœnix, and forms the beginning of a new Department of special interest to those scientists devoting themselves to the study of botany." As well known to those who have visited this Museum, the Economic Department contains a very large and interesting collection of native and foreign woods. This collection has been so greatly increased during the last year by the labors of a corps of experienced botanists under the direction of Prof. C. S. Sargent, that it has been found necessary to transfer the specimens temporarily to the Arsenal building in Central Park, where they will be displayed to the public during the coming autumn.

Proceedings of the Torrey Club.—At the regular meeting of the Club held at Columbia College, Tuesday Evening, April 11th, the President occupied the Chair, and twenty-two members were present.

After the reading of the minutes the President announced the death of Mr. W. H. Leggett, and remarked at some length upon his life, character and attainments. Judge Brown and Mr. Gerard were appointed a Committee to draft resolutions proper to the occasion.

Plants Exhibited.—Mr. Chamberlin exhibited a collection of marine algae gathered in New York Harbor, and, with it, a number of different forms of a species of *Grinnellia*. The President showed the floating-bladder of a species of *Macrocystis* from California and gave an account of the plant which bore it. Mr. Schrenk exhibited a specimen, preserved in fluid, of a seedling *Iris*, showing a peculiar mode of germination.

Preservation of Specimens of Coniferae.—Mr. Schrenk stated that, after an unsuccessful trial of many expedients for the preservation of specimens of Coniferae for the herbarium, he had found that by soaking the specimen in Wickersheimer's preservative fluid it was rendered flexible, and no longer showed a tendency to shed its leaves after being pressed and mounted.

One corresponding and two active members were elected.

At the regular meeting held Tuesday evening, May 9th, the President occupied the Chair and twenty-three persons were present. Resolutions expressive of the Club's respect for the late Mr. Leggett, and of its sympathy with his relatives in their bereavement, were read and adopted, and a draft of the same was directed to be transmitted to the family.

The Herbarium.—The Chairman of the Herbarium Committee announced the receipt of a gift to the Club's herbarium, from Mr. Geo. E. Davenport, of a collection of Alaskan ferns.

Plants Exhibited.—Mr. Braman exhibited a small collection of fresh specimens of plants sent from Wisconsin by Mrs. C. T. Tracy, comprising the following species: *Anemone patens*, L., var. *Nuttalliana*, Gray; *Isopyrum biternatum*, T. & G.; *Trillium grandiflorum*, Salisb.: and *Erythronium albidum*, Nutt. Mr. Schrenk showed a seedling *Iris* growing in a flower-pot, and exhibiting the same peculiarities in its mode of germination as the preserved specimen exhibited by him at the last meeting. The President exhibited the leaves of a number of species of *Platanus* and remarked upon the manner in which, in the West, the seeds of *P. occidentalis* are disseminated in the spring.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. IX.] New York, August, 1882. [**No. 8.**

A New North American Rose.

By C. C. Parry.

On a recent botanical excursion in the upper part of Lower California, between the 5th and 15th of April of the present year (1882), among other interesting discoveries in that little-known district, a remarkable new species of *Rosa* was met with, which, on account of its peculiar botanical and horticultural features, seems deserving of an early notice.

It was first seen in riding along a well-travelled road, skirting the shores of All Saints' Bay, between Sanyal and Encenada, about the parallel of 32° N. latitude, becoming abundant, and forming dense low thickets on dry slopes shut off from the sea-breezes, and composed of crumbling ferruginous sandstone. Forming, as it did, a most conspicuous and agreeable feature in the arid landscape, with its finely divided foliage and showy pink or white flowers, it attracted the attention of all the members of the party, which included Messrs. C. G. Pringle, C. R. Orcutt, M. E. Jones and the writer, by all of whom full collections were made.

Specimens were shortly afterward sent to Dr. Engelmann, of St. Louis, who, at the request of three of the discoverers, Mr. Pringle, Mr. Orcutt and myself, has kindly furnished the following diagnosis and description, from which the readers of the Bulletin can form a clear idea of its peculiar botanical characteristics:

✓ Rosa minutifolia, *n. sp.*—A much-branched shrub, 2–4 feet high; ✓ shoots pubescent, densely covered with straight or slightly recurved, red-brown, bristly, at first pubescent spines, their leaves with broad, divaricately auricled stipules, and mostly 5 leaflets; fertile branches bearing numerous terete, subulate spines, some of the shorter and more persistent ones often in pairs under the branchlets; leaves fasciculated on short spurs, narrow stipules divaricately auricled, leaflets minute (only 1—2 lines long, the lowest pairs the smallest) oval, simply incised-dentate, pubescent, not glandular; flowers single, $\frac{3}{4}$—1 inch wide, on tomentose, bractless peduncles from between the leaves; calyx-tube globular, densely setose-hispid, a thick nectariferous ring contracting its opening; petals suborbicular, scarcely emarginate, deep rose-purple or white; central ovules borne on short stipes; styles distinct, short, woolly.

Described from specimens sent by Dr. C. C. Parry and M. E. Jones. A most striking and lovely species, distinguished from all other roses by its minute, deeply incised leaflets. The young shoots have larger, distant leaves, with fewer, but larger leaflets, the terminal one the largest, sometimes 4 or 5 lines long; fragrance faint. This species is quite peculiar among its American congeners, and even among the roses of the Old World, so that it is difficult to determine its true position. In aspect and habit it comes nearest to the

Pimpinellifoliae on account of its single bractless flowers, its numerous acicular spines, and its small leaves ; but it recedes in its pinnatifid calyx-lobes.—*G. Engelmann.*

New Species of North American Fungi.

By J. B. ELLIS.

VOLUTELLA DIAPHANA.—Punctiform, minute, white, substipitate, marginal hairs few, straight, hyaline, septate below and united by a membrane, which forms a receptacle filled with the oblong-elliptical, hyaline, 1–2-nucleate spores, .0002′ long.

Very near *V. Hyacinthorum*, Berk., but apparently distinct.

On decaying leaves of *Orontium aquaticum*. October.

HELICOSPORIUM MICROSCOPICUM.—Tufted, minute, scarcely visible without a lens. Tufts cinereous-brown, consisting of a prostrate, subhyaline, branching hypha, with erect, faintly septate branches bearing lateral, closely coiled, .0005′ in diameter, 12–20-septate, pale brownish spores of about two coils.

The manner of growth seems to be as follows : The tip of the young erect thread coils upon itself and forms a spore, after which the same thread pushes its growth still further, but in a direction a little inclined to that of its former growth, when the tip coils again in a direction opposite to that of the first coil, forming a second spore. Whether this manner of growth is continued further I have not observed.

The spores or conidia soon fall away, and the thread that bore them becomes erect and straight. The mature spores are slightly constricted at the septa.

On decaying staminate catkins of *Alnus serrulata*, lying on the ground in damp thickets. June.

ISARIOPSIS GRAYIANA.—Appearing like a thin, tufted, brown pubescence. Tufts .005′ high, composed of numerous, rather slender (.0001′ in diameter), closely septate, subnodulose threads, more or less abruptly bent above, and bearing at their tips the small, .0002′—.0003′, oblong-elliptical, simple or uniseptate spores.

Occasionally, some of these spores become more elongated and 2–3-septate.

On old canes of *Rubus villosus*, lying on the ground. West Chester, Pa.

ZYGODESMUS RUDIS.—Hypha coarse, showing only here and there the zygodesmoid joints ; spores, or conidia, subglobose, strongly but rather sparingly echinulate, about .0003′ in diameter.

Forming a thin, light ferruginous stratum on the under side of a charred cedar log. Found also on decaying *Rhus venenata*.

VALSA DIDYMOSPORA.—Perithecia 6 to 10, globose, .013′ in diameter, circinating on the surface of the inner bark, and circumscribed by a black line which penetrates the wood, but not deeply ; ostiola cylindrical, about equal in length to the diameter of the perithecia, converging with their tips united and bent upwards, piercing the epidermis, which is only slightly elevated ; asci clavate-cylindrical, small, .001′–.0012′x.00015′; sporidia minute, .000125′

long by half as wide, composed of two globose cells united into an oblong spore.

When the epidermis is peeled off, the perithecia generally adhere to its inner surface.

On dead limbs of *Ilex opaca*. March.

VALSA CERCOPHORA.—Perithecia few, 4 to 6, rather large, imbedded in a subcarbonaceous stroma, which is circumscribed by a black line penetrating the wood; ostiola stout, obtuse, with a large opening, united into a subconical disk, which pierces the epidermis and rises slightly above it; asci clavate-cylindrical, .003′–.0033′x.0004′—.00045′; sporidia biseriate, oblong-elliptical, constricted in the middle and appendiculate at each end, .0004′—.0006′x.00015′–.000175′, hyaline, with several small nuclei.

The appendages, which are finally absorbed, are as long as, or longer than the spore itself, and the upper one is generally recurved at its extremity. The limbs on which this species grows are not so much decayed as those on which the preceding species is found, being still sound and tough.

On dead limbs of *Ilex opaca*. March.

VALSA FARINOSA.—Stroma cortical; perithecia few (2 to 4,) pale, .013′ in diameter, raising the bark into little prominences, which indicate their position; disk tuberculiform, yellowish white, of a loose granular or mealy substance; ostiola large, pale horn-color, ovate or conic, at length disappearing and leaving a large opening; asci clavate-cylindrical, obtuse; paraphyses indistinct; sporidia 1- or 2-seriate, acutely elliptical, subhyaline, with a large central nucleus, about .0006′x.0002′.

Very variable with regard to the ostiola, which are often entirely wanting. Some of the stromata contain perithecia filled with brown, appendiculate stylospores of about the same size and shape as the ascospores, and which appear referable to Dr. Cooke's genus *Harknessia*.

Fern Notes. V.

By GEO. E. DAVENPORT.

Notholaena tenera, Gillies.—This rare fern, which Dr. Parry found so unexpectedly in Utah, in 1874, has again turned up, but this time in the San Bernardino Mountains of California, where it was discovered in May last by the Parish Brothers, who write that it was found "growing very sparingly in two neighboring cañons at an altitude of perhaps 5,000 feet. In both places it grew in crevices of precipitous limestone cliffs, which were quite dry at the time of our visit, and do not seem to be ever really wet. In one cañon there was a single specimen, and in the other some twenty or more, but most of them dry, and the others, as you see, in poor condition."

The specimens which I have received are clearly identical with the Utah plant, and differ but little from Parry's or Palmer's specimens.

It has already been recorded (Ferns of North America, Vol. i., p. 337) that some doubts exist in regard to the correct identity of the Utah plant, but the figure in *Botanical Magazine* (Vol. lviii., plate

3,055), where the species was originally described by Hooker under Gillies's manuscript name, from plants cultivated from spores, may, it seems to me, be fairly taken to represent our plant, only in a larger form, otherwise the characters are the same. Lowe's figure (Vol. i., pl. xv.) also appears to have been taken from cultivated plants, from which due allowances are to be made for plants in a state of nature. Kunze's figures I have not seen.

Lygodium palmatum in New Hampshire.—Mr. Wm. H. Bates, of St. Paul's School, Concord, N. H., wrote me in April last that he had found a single frond of last year's growth of this species growing in a low meadow half a mile from the school. The frond measured about seven inches in length, and had seven pairs of sterile pinnae. Mr. Bates states that Prof. Hitchcock, in his Geology of New Hampshire, credits *Lygodium* to Hudson, N. H., but I have no knowledge of its presence in that State authenticated by actual specimens.

It is to be hoped that Mr. Bates will be fortunate enough to find later a sufficient number of specimens to establish its presence there beyond a doubt.

Asplenium Filix-foemina, Bernh.—Mr. Bates has sent me a small doubly-crested frond of this species, taken from a plant found by him last summer in a rocky meadow near the school, and answering very well to *Athyrium Filix-foemina*, var. *crispum*, Moore. This form is sometimes met with in cultivation, but there is no good reason why such forms should not occur here occasionally in a state of nature as well as in England where they are not uncommon, and Mr. Bates has not been able to find any evidence of his plant having escaped from cultivation.

Botrychium simplex, Hitchcock.—Mrs. M. J. Myers sends some fine, robust specimens of this species which were collected near Ithaca, N. Y., by Prof. W. R. Dudley. Two of the specimens approach the ternate form, and two have the stipes unusually developed so that the lamina appears as if placed above the middle, as in Milde's var. *fallax*.

From Miss Furbish, I have just received specimens of *B. simplex* collected by her in Rangeley, Maine, making still another station for this species.

Abnormal Growths in Botrychia.—Mrs. Myers has also sent me for examination a weakly developed specimen of *B. Lunaria*, which has two fertile branches, the second, and extra branch springing from the stipes just below the first, and a portion of the sterile segments bearing from one to four sporangia. The specimen, with a younger one, was collected in Cicero Swamp, near Syracuse, by Prof. Dudley.

From Strong, Maine, comes a large specimen of *B. lanceolatum*, collected by Miss Furbish, with the lamina nearly transformed into a fertile panicle. The specimen is further interesting in showing the two portions of the bud standing nearly upright, and with only a very slight inclination towards the thickened stipes over which they would have reclined later in the season.

Osmunda Claytoniana, L.—Mr. F. W. Morandi has collected in Malden, Mass., some interesting specimens of this species in which the fertile pinnae retain nearly the appearance of the sterile, and bear a marginal fructification. Some of the pinnae are only very slightly contracted, and, showing the green surface of the lamina between the marginal lines of sori beneath, as well as on the upper side, have an elegant appearance. In some of the specimens the fructification is carried upward on to the normally sterile pinnae; in one instance, to within three pairs from the top, and in another, with four pairs of fertile pinnae which show the green tissue between the lines of sporangia, the fructification is carried up on one side only, nearly to the top. Examining the venation in such portions, I found that, whereas in the wholly sterile segments the veins forked once or twice with great regularity, extending from a nearly straight costa to the entire margins, in the fertile segments the margins were more or less toothed, and either a single vein projected from the more eccentric costa into each notch or sinus, and bore on its slightly thickened, or obsoletely forked apex a sorus, or, in the broader segments, that the veins forked once, the branches terminating in the notches of the doubly-serrated margin and bearing on their apices the much reduced sori.

Osmunda cinnamomea, L.—Mr. Storrow Higginson once pointed out to me a distinctive character, which, so far as my observations have since extended, appears to be quite constant in this species, and may serve to aid those who are sometimes puzzled to distinguish between its sterile fronds and those of its congener *O. Claytoniana.* In *O. cinnamomea* there will be found at the base of each pinna a small persistent bunch of wool which is nearly or wholly wanting in *O. Claytoniana*, and of which no mention has been made anywhere that I am aware of.

Helonias bullata on Staten Island.—While botanizing near Rossville, S. I., in the early part of April with Mr. Arthur Hollick, my attention was drawn to numerous specimens of a plant having a tuft of parallel-veined leaves at its base, which had apparently remained green all winter. We at once suspected that it might prove to be *Helonias*, as we knew of nothing else resembling the plant in question native to this part of the country. Deeming the discovery of sufficient importance to warrant further investigation, we made another trip to the locality on the 28th of May, and were rewarded by finding a single flowering specimen, almost gone, to be sure, but showing plainly that our first surmise was correct.

The locality is about three-fourths of a mile south of Rossville, a short distance west of the road leading from that place to Kreischerville. It is in a maple swamp near a clay bed.

Many other pine barren plants grow in the vicinity, notably *Ascyrum Crux-Andreae*, L., *Euphorbia Ipecacuanhae*, L., and *Aster concolor*, L. I have already referred to the remarkable manner in which the pine barren flora extends into Staten Island (see BULLETIN, Vol. vii., p. 81), and the discovery of *Helonias* there adds another species to my list, and a new one to the flora of New York State.

June 20, 1882. N. L. BRITTON.

Teratological Notes.—On a small single *Fuchsia* (*F. fulgens*, var.) that I have been watching, so large a percentage of the flowers (considerably over one-half) are monstrous, and the forms produced are so different that it may be worth while to record those that were noticed, though cases similar to several of them are already on record. They will be readily understood from the diagrams annexed, which represent plans of the flowers above the calyx-tubes.

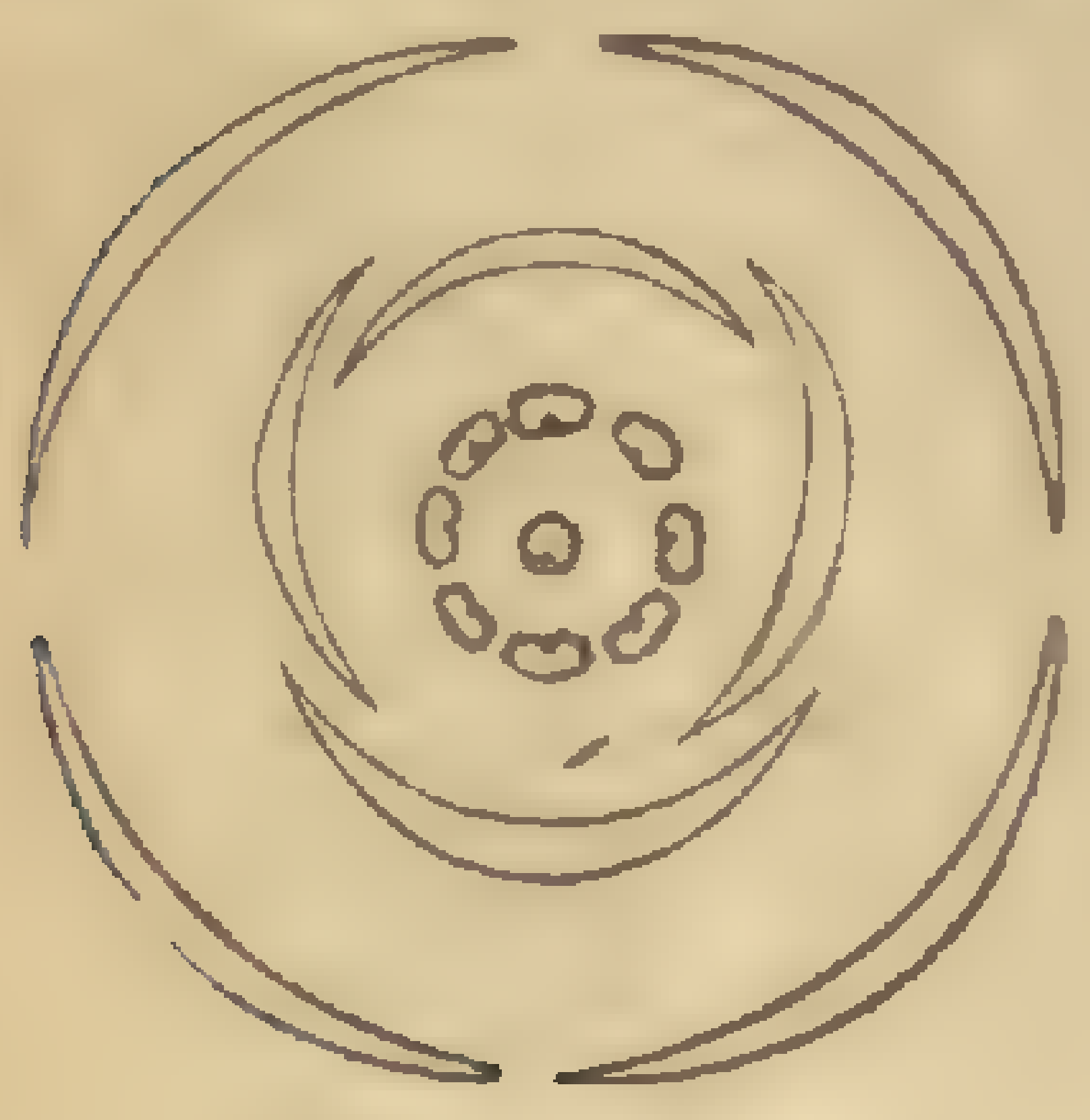


Fig. 1.

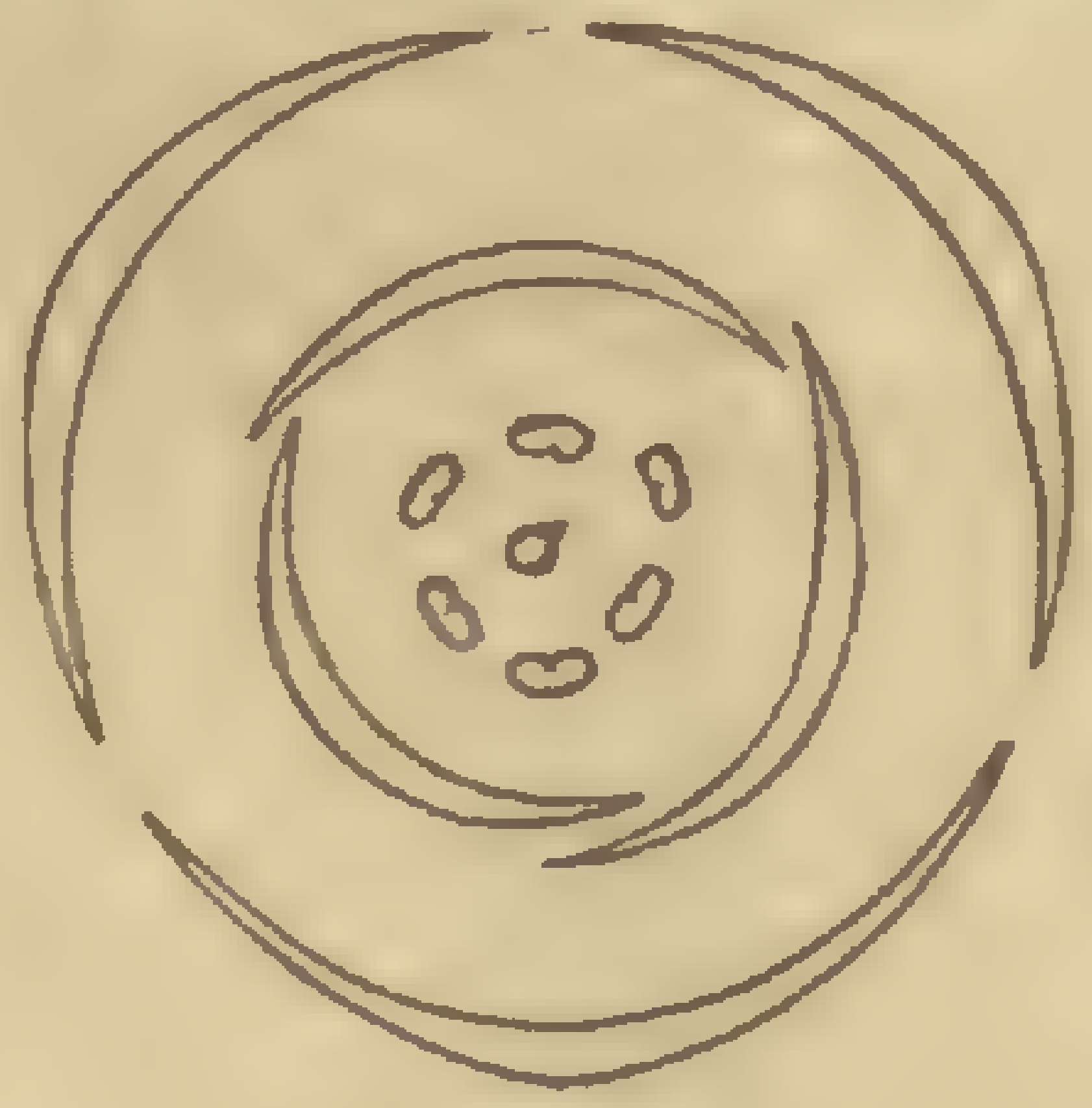


Fig. 2.

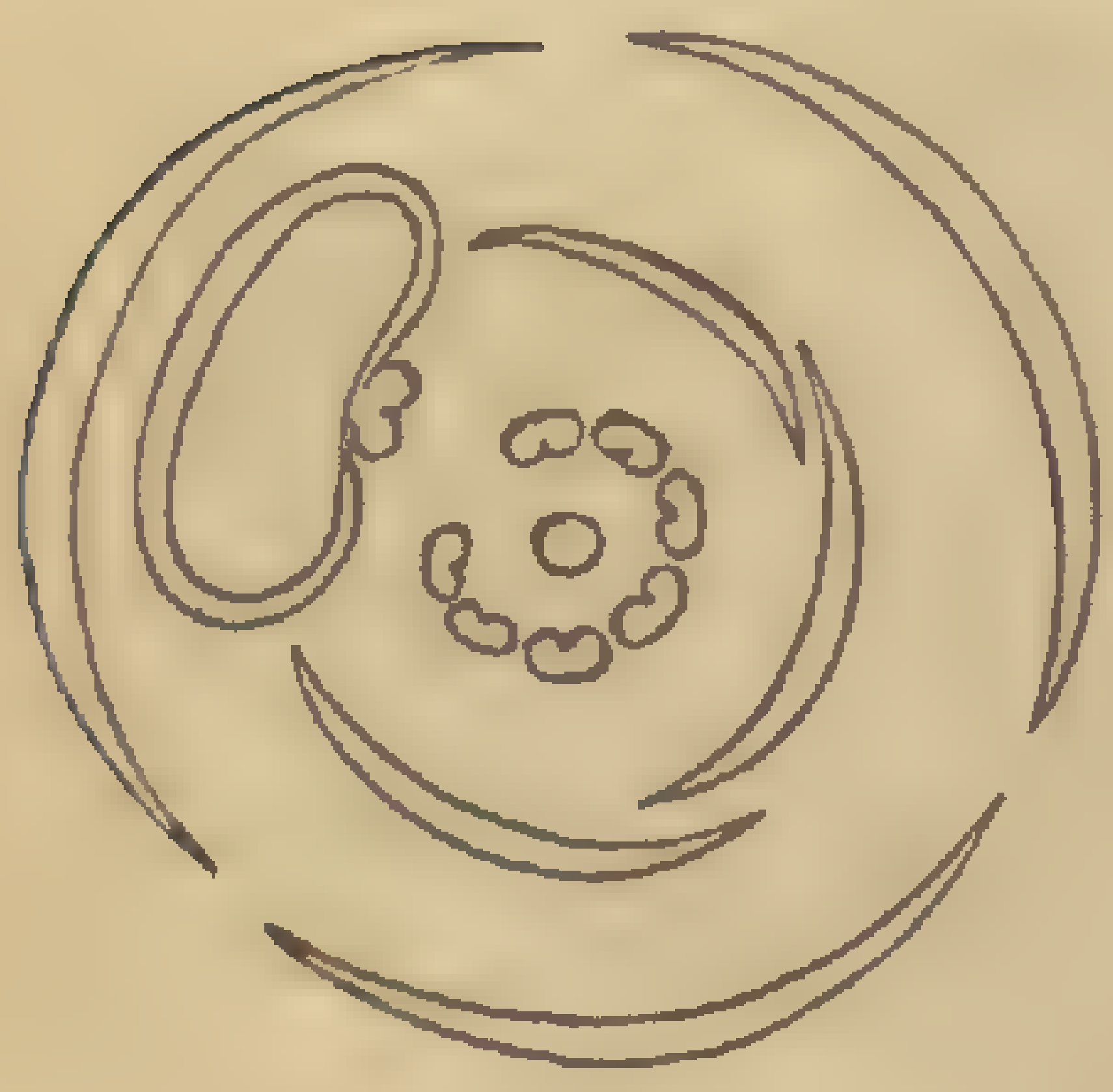


Fig. 3.

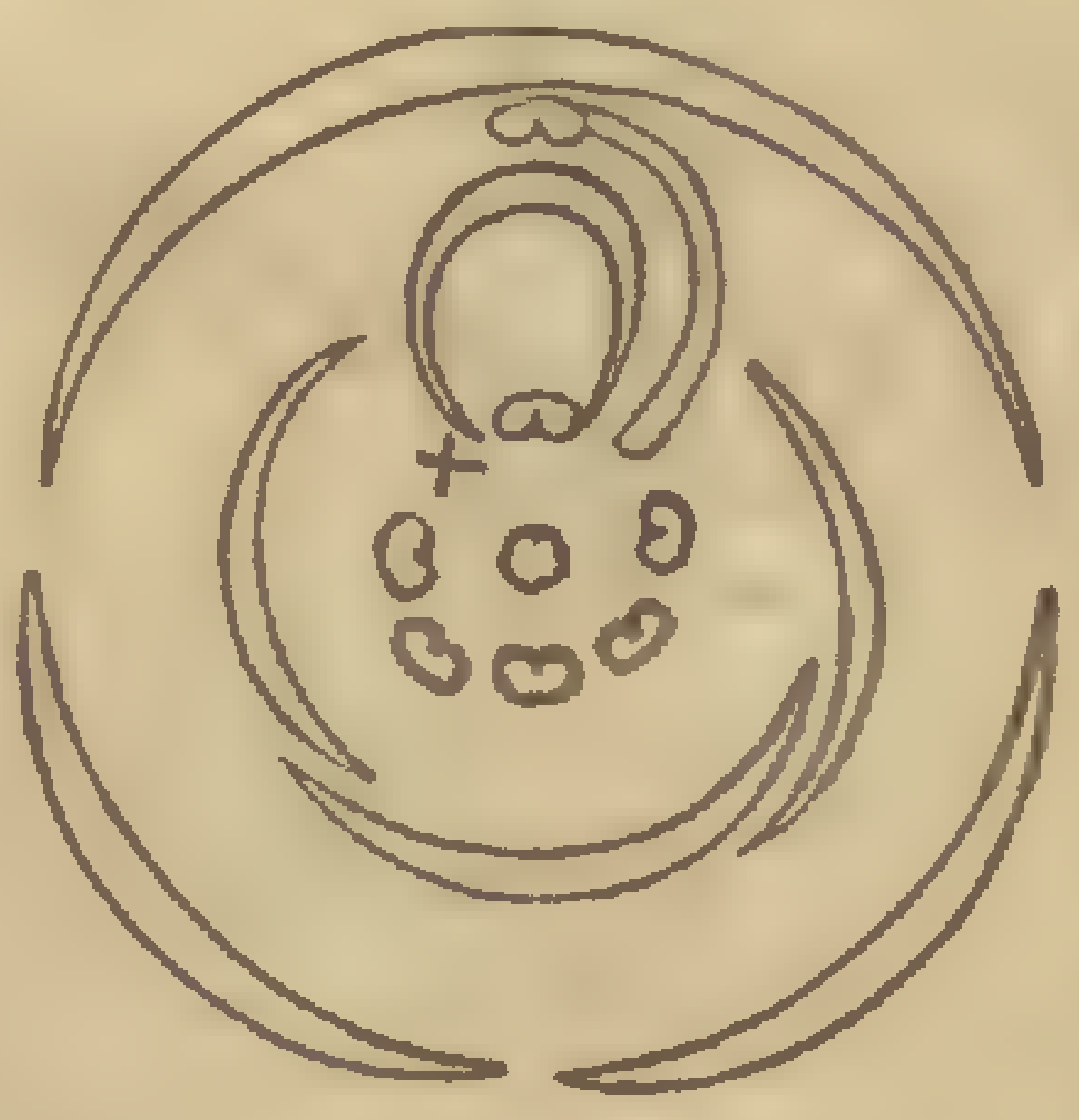


Fig. 4.

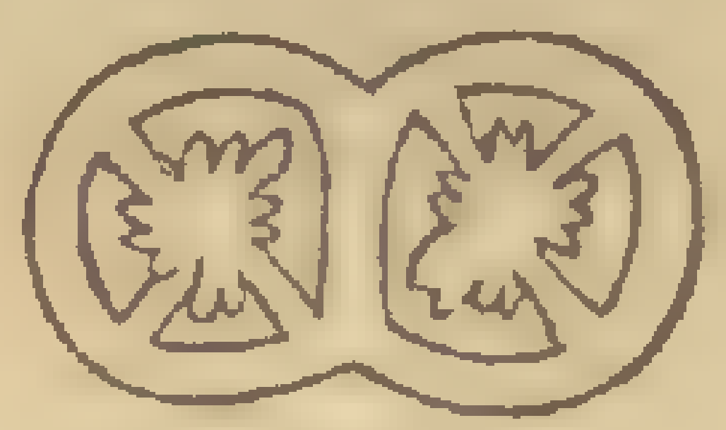


Fig. 5.

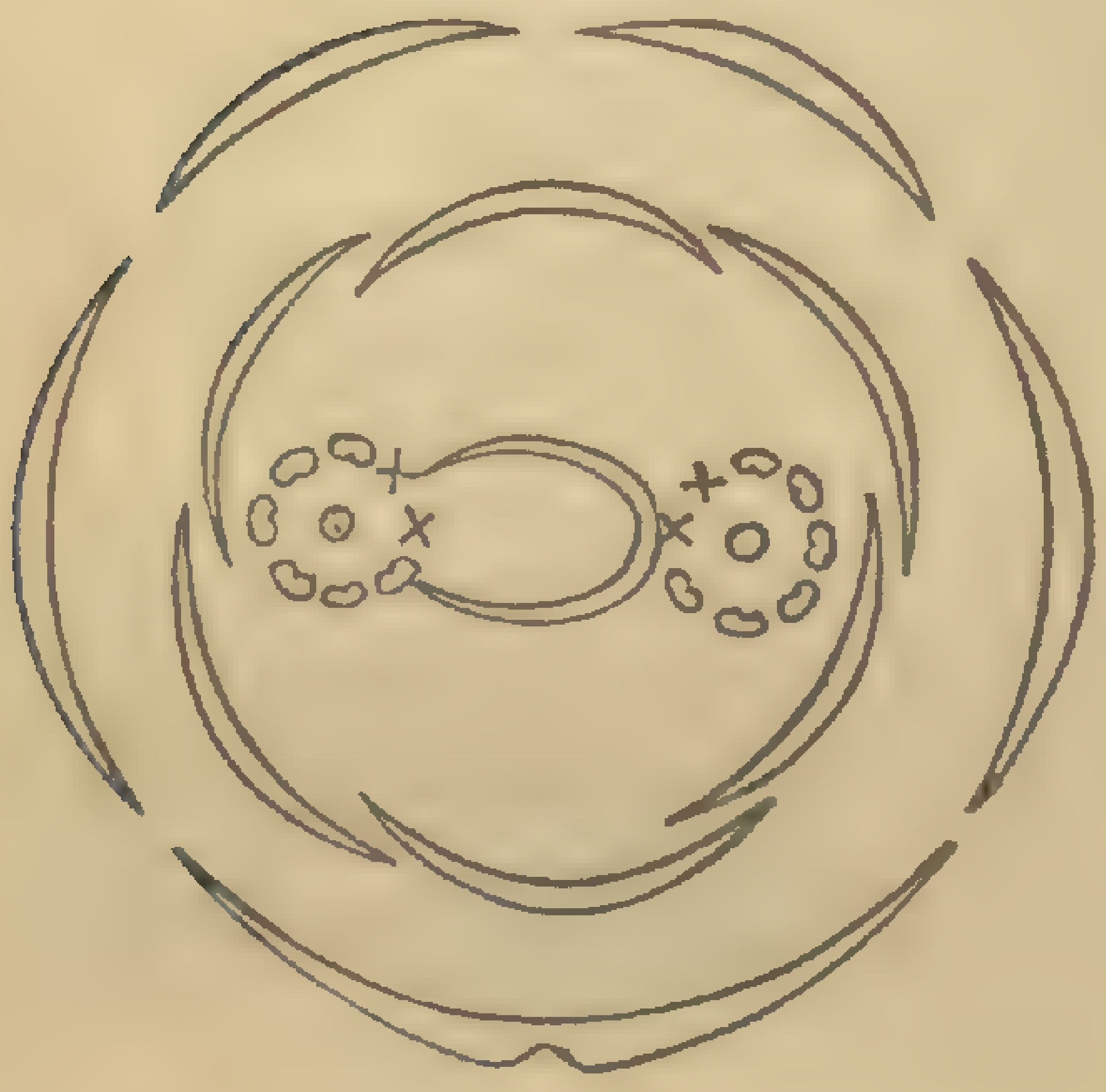


Fig 6.

Besides the normal tetramerous flower (Fig. 1), several were noticed that were trimerous throughout (Fig. 2). In one flower, otherwise normal, a stamen adhered by the whole length of its filament to the middle of the calyx-lobe before which it stood, and on which it thus came to form a wide-topped crest, its anther being free and polliniferous. One flower (Fig. 3) was normal excepting that two contiguous segments of the calyx were united, and so reduced in size that this organ appeared regularly trilobed, while the petal opposite the line of union had its edges somewhat involute and fused with the filament before it, so as to form a horn-like organ something like the spur of an *Aquilegia*. Two calyx-lobes of another flower (Fig. 4) were adherent throughout until anthesis, when they tore apart irregularly for about one-half the distance from tip to base. The stamen opposite one of them was entirely wanting; that before the other was free from its insertion up to the anther, which was joined by a small part of one edge to the middle line of the double calyx-segment. The other parts were normal. Finally, two flowers (Fig. 6) were joined from the bases of their peduncles to the top of the calyx-tubes. The adjacent sepals of each, on one side, were united. One calyx-segment and two stamens were suppressed on the united sides, and the ovary of each was three-celled through the imperfect development of the corresponding septa (Fig 5). In several of these forms the aestivation was considerably disturbed.

Flowers of the sea-onion (*Urginea Scilla*) not infrequently show meiophylly, either of the whole flower, when there are five divisions of the perianth, five stamens and two carpels, or of the gynoecium only, when there are but two carpels, the other parts being in double whorls of three each.

Madison, Wisc. WILLIAM TRELEASE.

A List of Grasses collected by Mr. C. G. Pringle in Arizona and California, with descriptions of those species not already described in American Publications.*

✓ 35. **Sporobolus cryptandrus* (Torr.) Gray, var. *stricta*.—A robust form, nearly 4 feet high, with an erect, densely flowered, narrow, wand-like panicle (18–20 inches long), the lower portion enclosed in the inflated sheath of the upper leaf. The panicle is remarkably light colored.

Banks of the Rillita, near Camp Lowell. June. This grass represents one extreme form of the species, the other extreme being represented by the var. *flexuosa*, Thurber.

✓ 36. **Sporobolus Wrightii*, Munro, MS.—Culm stout, erect from a creeping root-stock, leafy, branched at base; sheaths smooth, pilose at the throat, longer than the internodes; ligule a narrow, ciliate ring; leaves smooth without, scabrous within, 2-3 lines wide below, tapering into a very long, filiform, scabrous tip, upper leaf nearly a foot long; panicle lanceolate, base enclosed in the upper sheath, 12 inches or more long, branches very numerous, more or less spreading, 2–3 inches long, flower-bearing for nearly their entire length; spikelets a line long; empty glumes unequal, very thin, the lower nerveless, a third shorter than the very faintly one-nerved upper one; flowering glume obtuse, similar in texture to the empty ones; palea as long as its glume.

This is a robust species, with stout, leafy culms, a long, handsome panicle, with numerous slender racemous branches; spikelets grayish or lead-colored.

Near Pantano, Arizona. June.

The determination of Pringle's specimens was made by comparison with specimens in herb. Acad. Phila., collected at Camp No. 12 on the Little Colorado, Oct. 6, 1851. Mr. G. R. Vasey collected the same in New Mexico last season.

37. **Sporobolus asperifolius*, Thurber, Bot. Cal., ii., p. 1,269; *Vilfa asperifolia*, Nees & Meyen, in Trin. Agrost., i., 73; *Sporobolus arenaceus*, Buckley, in Proc. Phila. Acad., 1862, p. 89.

Santa Cruz Valley, near Tucson. June.

38. *Sporobolus gracillimus*. *Vilfa gracillima*, Thurber, Bot. Cal., ii., p. 268; *V. depauperata*, var. *filiformis*, Thurb., MS.; Watson, Bot. King's Exped., p. 376.

Mountains about the head-waters of the Sacramento River, California. August. (136.)

✓ 39. *Sporobolus depauperatus* (?). *Vilfa depauperata*, Torr., in Hook, Flor. Bor. Am., ii., p. 257; *Vilfa utilis*, Torr., Pacif. R. R. v., p. 365.

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* Continued from p. 89.

Panicle ½–1 inch long, simple or shortly branched below, empty glumes ½, nearly 1 line long, ovate-acute or lanceolate-accuminate and mucronate or shortly awn-pointed; floret linear with a distinct, hairy callus, 1¼ line long, terminating in a slender awn, 1-3 lines long; palea acute, equalling its glume; grain linear, nearly a line long

Rocky cañons, Santa Catalina Mts., alt. 5,000 feet. May.

The general appearance of this grass, and especially the character of the spikelets is so like that of *Muhlenbergia* that it is referred to *Sporobolus depauperatus* with considerable doubt. The culm is nearly 3 feet long, very firm and hard below, very much branched above, forming a long mass of slender branches with filiform, divergent, thread-like leaves.

This is probably the same form as that collected at Tejon Pass by Mr. Blake, which Dr. Thurber (Bot. Cal., ii., p. 268) describes as "a tangled mass of long, flexuose, filiform and very tough culms." Dr. Thurber adds that this appears to be the form assumed by the plant in the southern localities, where it is much sought after by the Mexicans, who use it for stuffing their large leathern *aparejos*, or pack-saddles, a purpose to which its toughness and elasticity especially adapt it. It was this use of it which led Dr. Torrey to give the name *V. utilis.*

Pringle's specimens agree in habit with those of Lindheimer's Texan collection (1846), but the spikelets are different, having, as stated above, the characters of a *Muhlenbergia* (calling to mind those of *M. sylvatica*); yet, there is so much variation in the minute characters of those in the same panicle that it suggests an abnormal development. It is unlike any *Muhlenbergia* before observed, and is referred to Dr. Torrey's *Vilfa utilis* because of its resemblance in habit to descriptions of that grass, and to Lindheimer's specimens.

40. *Sporobolus ramulosus*, Kth., En. Pl., i., 215; Thurber, Bot. Cal., ii., p. 269; *Vilfa ramulosa*, HBK., Nov. Gen., i. 137, t. 684; Watson, Bot. King's Exped., p. 376; *Agrostis minutissima*, Steud., Syn. Gram., 171.

By streams, Santa Catalina Mts. May.

41. *Agrostis arachnoides*, Ell., Bot. Carol., 134; Chapman, Flor. S. States, p. 551.

Near Camp Lowell, Arizona.

42. **Agrostis exarata*, Trin. Watson, Bot. King's Exped., p. 377; Thurber, Bot. Cal., ii., p. 273.

There are two forms; No. 466, from the banks of the Rillita, May, and No. 468, with a more slender panicle, gathered by brooks of the Santa Rita Mts. in July.

43. *Agrostis varians*, Trin., Agrost., ii., 68; Thurber, Bot. Cal., ii., p. 273.

Mountains about the head-waters of the Sacramento River; alt. 8,000 feet. August.

44. **Agrostis verticillata*, Vill., Delph., ii., 74; Trin., Icon., t. 36; Thurber, in Bot. Cal., ii., p. 272.

Banks of the Santa Cruz, near Tucson. May.

45. **Agrostis scabra*, Willd., Sp., i., 370; Gray, Man., 5th ed., p. 611; Thurber, Bot. Cal., ii., p. 274.

By streams of the Santa Catalina Mts. May. Distributed as *Agrostis elata.*

46. *Gastridium australe*, P.B., Agrost., 21, t. 6, f. 6; Thurber, Bot., Cal., ii., p. 275.

Girard College, Philadelphia. F. LAMSON SCRIBNER.

Notes on the Genus Sphagnum.—*Europas och Nord Amerikas Hvitmoosor* (*Sphagna*) is the title of a monograph on the *Sphagna* or peat-mosses of Europe and North America recently issued by the eminent European bryologist, Prof. S. O. Lindberg. It is in pamphlet form, without illustrations, and the first 38 pages are devoted to an introduction treating of the various portions of the plants, followed by 88 pages containing descriptions of 21 species, to each of which is added a full synonymy. The introduction and foot-notes are in Swedish. I briefly note the following changes in nomenclature, where the names in *italics* have been reduced to synonyms:

S. *Austini*, Sull.,=S. imbricatum, Hornsch.
S. *cymbifolium*, Hedw.,=S. palustre, L.
S. *molluscum*, Bruch.,=S. tenellum, Ehrh.
S. *acutifolium*, Ehrh.,=S. nemoreum (Jung.) Scop.
S. *macrophyllum*, Bernh., var. *Floridanum*, Aust.,=S. cribrosum, *n. sp.*, Lindbg.
S. *mendocinum*, S. & L., is referred to S. cuspidatum, Ehrh.

Prof. Lindberg has based his diagnosis of the new species, *S. cribrosum*, upon specimens I recently sent him, and which were collected in Florida by the late C. F. Austin. It appears that the typical *S. macrophyllum*, Bernh., was not collected in Florida either by J. D. Smith or C. F. Austin. Specimens recently communicated by J. D. Smith, collected in Eastern Florida and along the Caloosa River, all prove to be *S. cribrosum*, Lindbg. No inflorescence has been detected on any of the specimens thus far collected.

"*Sphagnum cribrosum*, n. sp., Lindb.—Dioicum? inferne vix luridulum, superne argenteo-album, admixta exigua flavedine, nitidissimum. Trunci strata epidermacea 3, hic illic 4, 5 vel 2, non fibrigera, idem superficiale extrinsecus non perforatum. Fasciculi ramorum a ramis 3 vel 4, omnibus divaricatis. Folia trunci sat parva, ovato-triangularia, late truncata, ubique acellulis, mediane a poris ad 8 usque sat magnis, uniserialibus vel in media parte cellulae per paria hic illic positis perforatis, constructa, anguste et intus indefinite hyalino-limbata, integerrima, excepto apice summo brevissime maleque dissoluto. Folio ramorum ad 9 mm. longa et 2.25 mm. lata, non quinquefaria, laxissima, recta et stricta, solum canaliculata, anguste ovato-oblonga, vix acuta, superne lata, apice rotundato-obtusa et cucullata, truncatula, anguste et intus pessime definite limbata, integerrima, excepto apice denticulato, dentibus in plano foliari positis, cellulae inanes, 0.3—0.4 mm. longae et 0.02 mm. latae, poris minutissimis, ut sexies minoribus quam in antecedente, et numerissimis, 40–65 in quaque cellula maxima, intramarginalibus, aequidistantibus in tota cellula, alternatim vel hic illic per paria regulariter biserialibus, in cellulis summis tamen in seriebus 3 vel 4 valde irregularibus positis. Bractae femineae?

Sectio transversa foliaris, cellulae inanes in marginibus utrisque parum sed aequaliter arcuatae, intus in pariete ubique laevissimae; cellulae chlorophylliferae rectangulari-quadratae vel quadratae, perfecte in medio inter easdem inanes posita et eas omnino separantes, in marginibus utrisque planiusculae vel leniter rotundatae, conformiter parum incrassatae, lumine ejusdem formae et maximo.

Sphagnum macrophyllum, var. *Floridanum*, Aust., in BULLET. TORR. BOT. CLUB, vii., No. 2, p. 15 (1880). Rau & Hervey's Catal. N. Amer. Musci, p. 49 (1880)."

Hab. Florida. C. F. Austin; J. D. Smith.

Bethlehem, Pa. EUGENE A. RAU.

Notes on the Trees of the South-west.*—*Acer grandidentatum*, Nutt.—A few trees of this species, hardly large enough to be called trees, were observed in fruit in July, along streams in the Mogollon Mountains.

Canotia holacantha, Torr., grows sparingly upon hillsides in the San Francisco Mountains. Its wood appears to be useless except as fuel.

Quercus oblongifolia, Torr.—The shrubby form, doubtfully referred on p. 78 to *Q. pungens*, Liebm., belongs here, at least in part.

Populus balsamifera, L., var. *angustifolia*, is occasionally seen along the mountain streams in the higher altitudes.

Pinus edulis, Engelm.—Common throughout; seldom growing to be much more than a foot in diameter. Not observed on the highest mountains. I never found one with perfect seeds, and was informed that few trees ever produced them in the section where I collected.

Pinus ponderosa, Dougl.—This is the species from which most of the lumber used in the South-west is sawed. It contains a large amount of resin, and, for most purposes, is probably inferior to *Cupressus Arizonica*, E. L. G., but to no other here found. At an altitude of about 8,000 to 9,000 feet it is the predominant species, giving place above to *Pseudotsuga Douglasii*, Carr., and below to *Pinus edulis* and the *Juniperi*.

HENRY H. RUSBY.

Vincetoxicum nigrum, Moench., I find abundant here, between Highland Falls and the Point; more sparingly in Eagle Valley. I send this note, thinking the plant may not have been recorded.

West Point, N. Y., July 5th. W. W. BAILEY.

Botanical Notes.—*The Corona or Cup of the Narcissus.*—"What pages on pages have been written about this," says the editor of the *Gardeners' Chronicle* (Dr. Masters). "The fact is, it is a botanist's business to ask questions. When he sees a plant it is his business to interrogate it as best he can; so when he finds a flower presenting any peculiarity of structure like the cup of the *Narcissus*, it is his business, his duty and his pleasure to ask what it is, how it came there, what it means, and what is its use. The answer he gets to his questions depends very much indeed on the way the question is put.

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* Continued from page 80.

* * * In the case of the *Narcissus*-cup the answer to the question, what is it? has been sought in various directions, as by comparing the cup with similar conformations in other genera, such as *Pancratium*, or by observing the changes it sometimes exhibits when inclined to be 'sportive.' In *vino veritas*; so when a plant deviates from orthodoxy it very often lets out secrets not discernible at other times. Another mode has been by examining the mode of growth from the very earliest to the adult condition. Prof. Babington has kindly sent us a flower of *Narcissus poeticus* in which, to outward appearance, either one or two stamens have assumed the guise of the cup, or a portion of the cup has taken on itself the appearance of a stamen. Some years ago * * * the writer * * * ventured the opinion that the cup of the *Narcissus* consisted of a series of modified stamens. * * * There were grounds for this belief—there still are. Prof. Babington's flower might at first sight be cited in evidence along with others already recorded; but a more careful examination of the flower in question shows that, in this particular instance, it is not the corona reverting to a staminal appearance, but a dislocated and distinct stamen which is partially grown in union with the corona, and so looks as if it were a portion of the corona itself. The conclusions at which we arrived years ago were assailed by no less a person than Mr. Worthington G. Smith. On looking again at his arguments, after a lapse of years, it seems to us now that, while in matters of detail Mr. Smith was quite wrong, in matters of general principle he was quite right, in his interpretation of the mode of formation of the cup of the *Narcissus*. The ill-advised use of the word 'stipule,' and the false analogies thereupon based, concealed the underlying truth that the organ in question was and is an outgrowth from the flower-tube, and not necessarily either perianth-segment or stamen. In those days we relied upon one or two modes or styles of questioning when others were available, which would have shown, as they have done since, that the real interpretation of the corona of the *Narcissus* is that it is an outgrowth from the perianth-tube—an adaptation probably to facilitate cross-fertilization by insect agency. The cases formerly relied on to prove the staminal nature of the corona are capable of other interpretation, which it would be tedious to give here."

Local Floras.—Mr. Joseph Jackson, Jr., is contributing to the *Worcester Daily Spy* a series of lists of the plants of Worcester Co., Mass., each list including the names of 50 species, and the plants being recorded in the order of their flowering. It is the intention of the Worcester Natural History Society, we believe, to publish a complete flora of the county after sufficient material has been collected.

Mr. William C. Prime, in one of his recent "Lonesome Lake Papers" in the *New York Journal of Commerce*, has given a list of 83 plants (not including trees) found in flower in Franconia Valley (N. H.), and on the sides of the mountains, between May 20th and June 20th. Mr. Prime remarks: "Of course the list is not complete, but it will not be easy to add to it, for our researches were systematic and constant."

Dr. Charles Atwood, of Moravia, N. Y., notifies us by circular that he is gathering material with a view to publishing a flora of Cayuga County. The co-operation of local botanists is solicited.

Appalachia for June contains a few notes on the flora of the White Mountain region, and the statement is made that *Pinus Banksiana* has been detected on Welch Mountain (lat. 43° 55′ N., long. 71° 35′ W.)

The *Pharmacist* (Chicago) begins the publication, in the July number, of a catalogue of plants observed and collected by Dr. F. Brendel in the vicinity of Peoria, Ill., between 1852 and 1877. From a synopsis prefixed to Dr. Brendel's paper, we learn that the list will embrace the names of 874 species of Phaenogams and of 87 Cryptogams.

Botanical Literature.

Our Native Ferns and their Allies, with Synoptical Descriptions of the American Pteridophyta North of Mexico. By Lucien M. Underwood, Ph. D. 2d edition. Bloomington, Ill. 1882.

A little more than a year ago a neat and modest volume made its appearance under the title of "Our Native Ferns," which appears to have met with so much success that the author has disposed of his entire edition and now comes forward with a second, enlarged so as to include the entire *Pteridophyta* of the United States.

That portion devoted to the Ferns remains substantially the same as in the first edition, with only such changes and additions as were necessary to bring the work forward to date and make it complete—a fact which shows how much care the author bestowed upon his book in the first place, and guarantees the trustworthiness of the present edition; but the addition of the remaining vascular cryptogams greatly increases the value of the book, and makes it doubly useful to all who seek to study this class of plants.

The author tells us in his preface that he has spared no pains to make his book thoroughly reliable (a fact of which the book itself furnishes sufficient evidence), and has therefore consulted freely the descriptive works of the highest authorities in order to ensure certainty in his descriptions.

There is no apparent disposition, however, to follow others, unless by so doing his own purposes may be the better carried out, but, on the contrary, the author shows much originality of thought, and independence of judgment in the treatment of his work throughout.

The elementary part is clear, and well calculated to introduce beginners to the study of the plants treated of. The excellent key makes the analysis of the ferns comparatively easy. Of the other plants it is enough to say that their treatment rests upon such authorities as Dr. Engelmann for the *Isoetes*, Spring for the *Lycopodiaceae*, and Milde for the *Equiseta*.

The writer can personally testify to the earnestness and fidelity with which the author has sought to make his work complete, and cordially commends the book to all.

It should be in the hands of all who are especially interested in the vascular Cryptogams of the United States.—G. E. D.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. IX.] New York, September, 1882. [No. 9.

New Californian Compositae.

By EDWARD LEE GREENE.

PENTACHAETA ALSINOIDES.—Hirsute pubescent, 2–4 inches high, diffusely branched; heads numerous, on filiform peduncles 3–6 lines long, 3–5-flowered; scales of the narrowly turbinate or nearly cylindrical involucre 5 or 6; rays wanting; disk-corollas yellow, filiform, not deeply cleft; akenes fusiform, minutely and, for the genus, very sparingly pubescent; pappus of 3 scabrous bristles equalling the akene in length, or occasionally, in one or more of the akenes, reduced, or nearly obsolete.—*P. exilis*, Gray, var. *discoidea*, Gray. Bot. Cal. i. 305, as to the "very depauperate state about San Francisco" only.

The best specimens of this exceedingly well-marked species were collected by the writer on the Berkeley Hills, May 13, 1882.

The plant differs widely from even the rayless forms of *P. exilis*, in the first place by its diffusely branched and altogether sand-wort-like habit, continuing to branch and flower for weeks after the earliest involucres have matured and shed their akenes.

The akenes themselves are very characteristic, being fusiform and nearly naked, while those of *P. exilis* are obovate, or at most, obovate-oblong, and are always densely white-villous.

HEMIZONIA (HARTMANNIA) LOBBII.—Near *H. Heermanni*, Greene, but much more slender, the flowering branchlets filiform, and the heads consisting of only 3 ray- and 3 disk-flowers; akenes of the ray narrowly obovate-oblong, those of the disk crowned with a pappus of 8–10 linear, chaffy scales.

What is probably the only specimen extant of this uncommonly well-marked species, appears to have been lying for probably thirty years in the herbarium of the late H. G. Bloomer. The sheet to which it is fastened bears this note, in the handwriting of Mr. Bloomer: "*Calycadenia?* No. 323 in Lobb's catalogue is omitted. The plant was probably obtained near Monterey. H. G. B."

Though exactly like *H. Heermanni* in the character of foliage, pubescence, glandulosity, etc., it is very distinct by its extremely few flowered heads, and especially by the pappus of its disk-akenes. It forms an interesting third member of what may be called the *virgata* group of the genus.

HEMIZONIA (EUHEMIZONIA) CLEVELANDI.—A foot or two high, simple or branching, very hirsute below, and more or less glandular above; leaves linear, entire; heads small or middle-sized, racemose, sessile or short-peduncled; scales of the involucre with short tips, their margins not at all enfolded over the inner face of the obovate, rather sharply triangular akenes; rays 6–10, white, deeply 3-lobed; outer series of chaff united into a scarcely toothed cup.

The plant was collected many years since in Lake County, by

Dr. Bolander, and was obtained by the present writer in Napa County, in the autumn of 1874; but its specific character, as distinct from *H. luzulaefolia*, D.C., was first recognized about a year ago on the appearance of specimens freshly collected by Mr. Cleveland at Allen Springs, in Lake County.

In characters of flower and fruit it is so very like *H. luzulaefolia* that I detect no difference save in the manner in which the involucral scales hold the akenes In the latter their margins are folded over the inner face of the akene, so that the seeds falling to the ground carry the scales with them; but in *H. Clevelandi* they are in this respect wholly free, and falling, leave the scales still adhering to the receptacle.

The pubescence of the two is, however, very dissimilar, that of the one being appressed villous, and even floccose-woolly, and that of the other quite stiffly and setosely hirsute. *H. Clevelandi* has, moreover, fewer and larger glands. But the most obvious distinction between the two species is one so clear as to call for a modification of the character of the section of the genus to which they belong. I refer to the strictly racemose inflorescence of the new species; that of the other members of the group being uniformly corymbose.

HEMIZONIA (CALYCADENIA) CEPHALOTES.—Stem a foot or more high, simple, or with some assurgent branches from the base; lower portions of stem and branches leafy, with smaller leaves fascicled in the axils; heads densely capitate-crowded at, and near the summit; rays seldom more than one or two in each head, or often wholly wanting, and the disk-flowers as often reduced to three or even two; herbage yielding a pleasant balsamic fragrance.—*Calycadenia cephalotes*, D.C., Prod. v., pp. 695, and Torr. & Gray Fl. ii., p. 401. *Hemizonia multiglandulosa*, Gray, Bot. Cal. i., p. 366 in part.

The study of abundant specimens from all parts of the State, as well as careful observations on living plants, convinces me that this plant well merits specific rank. True *H. multiglandulosa* has an entirely different habit, the whole plant, from base to summit of the stem, being evenly branched, so as to form a contracted panicle, the heads freely scattered at the ends of the numerous branchlets. Its herbage has also a very different, and disagreeable odor.

HEMIZONIA (CALYCADENIA) OPPOSITIFOLIA.—Stem slender, a foot or less in height, simple or with spreading, opposite branches; leaves narrowly linear, all of them opposite; heads in pairs, closely sessile, one in the axil of each leaf, and an odd one at the summit of each branch; rays 3, very deeply 3-cleft, white or rose-color, changing to rose-purple; akenes and pappus much as in *H. cephalotes*; tack-shaped glands very few and small.

Collected near Chico, May 30, 1882, by Dr. C. C. Parry.

The species is near akin to the preceding, but well characterized by the strictly opposite arrangement of the leaves, branches and heads, a character quite new in the genus, and also by the remarkable paucity of glands, these being amber-colored, not black, as in the allied species.

VERBESINA VENOSA.—Shrubby, two feet or more high, the branches stout; leaves scabrous-puberulent, deep green, with coarse and prominent light-colored veins, ovate or ovate-lanceolate, two inches long, entire or with a pair of coarse teeth, or hastate lobes at base, abruptly tapering into a short, winged petiole ; flowering branchlets leafy below, naked above and terminating in a loose corymb ; involucre shorter than the disk ; rays conspicuous ; akenes sparingly villous and bearing a pair of stout, persistent awns of more than their own length.

The specimens lie in the herbarium of the California Academy, marked "Cedros Islands," and were probably brought thence, many years ago, by Dr. Veatch.

✓ MICROSERIS (EUCALAIS) ATTENUATA.—Leaves incisely and deeply pinnatifid, the divisions linear; scapes about a foot high ; involucre ½ inch long, and narrow ; akenes fusiform, 4–4½ lines long, very slender, especially from midway upwards ; pappus 4½–5 lines long, the elliptic-lanceolate scale more or less villous, and about one-third the length of the slender, strongly barbellate awn.

Collected by the writer on the 25th of April, 1882, on the grounds of the University of California, at Berkeley, where it grows in great abundance, as also on the hills adjacent. The akenes and pappus are extremely long and slender for the group into which it falls, but it is only as to length that they resemble those of the *Calocalais* section. The plant is a genuine *Eucalais*, a section whose best technical character is one which does not appear to have been recognized by any author, namely, the peculiar convolute aestivation of the pappus-scales. But the adoption of this character would exclude from the group *M. Bigelovii*, which has the imbricated aestivation, though not the habit of *Calocalais*.

New Species of North American Fungi.

By J. B. ELLIS.

VALSA LUTESCENS.—Stroma cortical; perithecia subglobose, 10 to 15, subcircinating, disk at length erumpent, brown, convex, with the short, cylindrical, stout, obtuse, substellate-cleft ostiola ranged round its circumference ; asci lanceolate, spore-bearing part .0013′x.00025′; sporidia cylindrical, hyaline, curved, .00025′–.0003′x.0001′.

On dead limbs of *Quercus coccinea.* January. The wood beneath the bark occupied by the fungus is generally stained light yellow. (N. A. F., No. 876.)

VALSA BINOCULATA.—Perithecia 3 to 6, rather large, closely imbedded in a stroma formed of the substance of the inner bark, and circumscribed by a black line which does not, however, penetrate to the wood ; ascigerous nucleus white, soft and pasty when fresh ; ostiola erumpent through cracks in the epidermis, subglobose, with a large irregular opening ; asci clavate-cylindrical, .005′—.006′x.006′–.0007′; paraphyses stout and granular ; sporidia uniseriate, broadly elliptical, nearly hyaline, uniseptate and constricted, with a large nucleus in each cell, .0008′—.0009′x.0005′—.00055′.

The ostiola are often entirely concealed so that outwardly there is no trace of the fungus.

On dead trunks of *Magnolia glauca.*

VALSA TUBERCULOSA.—Perithecia 8 to 10, globose, .015′ in diameter, buried in a stroma formed of the substance of the bark, which is not discolored, though rendered more compact, and surrounded by a black circumscribing line, which penetrates deeply into the wood; ascigerous nucleus whitish; ostiola short, cylindrical, stout, obtuse, with an irregular opening, united in a little fascicle, which barely pierces the epidermis; asci broadly lanceolate, .003′x .0006′; paraphyses filiform; sporidia biseriate, elliptical, with two large nuclei at first, and with the endochrome finally 2-parted, about .0005′x.0003′.

Sometimes two fascicles of ostiola are erumpent from the same stroma.

On dead branches of *Amelanchier Canadensis*. April.

VALSA VENUSTA.—Perithecia 15 to 20, .01′ in diameter, closely packed in a loose cortical stroma, which is circumscribed by a black line penetrating the wood; ostiola cylindrical, rough, slender, slightly swollen above, in length 2–3 times the diameter of the perithecia, at first united in a black, uneven, elongated disk, bursting out through longitudinal fissures in the bark, but which is finally obliterated by the compactly clustered, subobtuse ostiola; asci clavate-cylindrical, .002′—.0025′x.0002′—.00025′; paraphyses linear, nucleate; sporidia 8, cylindrical, hyaline, strongly curved, 3–4-nucleate, with the endochrome at length 3—4-times divided, .00035′–.00045′x.00075′.

On dead branches of *Robinia Pseudacacia*. (N. A. F., No. 875.)

VALSA AMPELOPSIDIS.—Perithecia few, seated on the surface of the wood, without any distinct stroma; ostiola cylindrical, subacute, their tips united in an elliptical plane disk, which bursts out through longitudinal fissures in the bark, but is at length obliterated; asci clavate-cylindrical; sporidia biseriate, elliptical, subacute, hyaline with a large nucleus in the centre or with 2–3 smaller ones, .0007′x .00025–.0003′.

On dead stems of *Ampelopsis quinquefolia*. (N. A. F., No. 881.)*

The Migration of Weeds—of those which may be called "domesticated plants," following man in his movements—and their occupancy of ground to the exclusion of other plants less hardy and able to stand in the struggle for life, is an interesting feature in geographical distribution. Our numerous railroads, traversing now the entire continent, and ramifying in every direction over the States, with their *through-freight* and *through-passenger* transportation, have become the chief agents in this distribution. This struggle for life on the new ground opened to the combatants is more intense than by the natural process, where the movements are governed by causes slower in operation, and extending over a longer period. Here the combatants, the champions which have won their belt on the fields (to borrow a phrase from the prize-ring), are transported more quickly, and brought face to face with each other. The effect of this is somewhat of a rotation. The weeds succumb—the stronger prevail. I have observed something of this in the streets and waste-places of Aiken during a period of twenty-five years past.

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*On page 74, line 27, of the BULLETIN the word "leaves" should be inserted after the word "fallen."

The habitat of *Peziza Hainesii* (Vol. viii., page 66) should be changed to read "rich soil among decaying leaves in dry woods."—J. B. E.

The principal weeds now—those most predominant, and occupying the waste-places and the untrampled portions of the streets, are *Helenium tenuifolium*, *Helianthemum Canadense*, *Acanthospermum xanthioides Lespedeza striata*, all, if we except *Helianthemum Canadense*, introduced plants; the first-named, from beyond the Mississippi, the two last from foreign regions. *Helianthemum* may also be classed as an introduced plant, for it has evidently come in from elsewhere, and only in the past few years has been making much progress.

Helenium tenuifolium is not indigenous to this region. It seems not to have been known by Elliott and our earlier botanists. Dr. Chapman gives its locality as "West Florida and westward"; Torrey and Gray, in North American Flora, "in Louisiana, Mississippi and Arkansas." I have seen it in quantity along the Georgia Railroad west of Augusta; abundantly in the neighborhood of Augusta; and in the streets of Aiken it is an "evil weed" occupying acres of ground in dense patches, encroaching upon the sidewalks, and giving the street cleaners extra trouble to keep it within bounds. I have had specimens sent to me from as far east as Sumter County in this State on a line of railroad. It has evidently traveled from beyond the Mississippi along the line of railroads, and is now probably pretty well disseminated over our Atlantic States.

Helianthemum Canadense, in the more light and sterile portions of the streets, occupies patches of several acres, to the exclusion of almost everything else, and is on the increase.

Acanthospermum is a much later importation. It was brought from South America, in wool used by the Augusta factories, about twenty-five years ago. It is abundant all around Augusta and along the line of the Georgia Railroad, running west; was reported in Macon several years ago, and now perhaps still further west; on the S. C. Railroad towards Charleston; on the N. E. Railroad from Charleston northward; and on the Augusta, Columbia and Wilmington Railroad in the eastern section of our State. Here, in Aiken, it is generally diffused through the town, all over the streets, in yards and in the gardens, and also extends out into the country around. It is an annual, seeding abundantly; and the small seeds, armed with hooked barbs, help to carry it to long distances.

Lespedeza striata, an importation from Japan, has been here for a longer period. I found it in small quantity, some forty years ago, in the coast region about forty miles north of Charleston; also along the State road within ten miles of the city. Elliott and the earlier botanists make no mention of it. MacBride, who aided Elliott in his "Sketches," and who lived in the very region where I first found it, and knew the flora very accurately, had never seen it. It was probably introduced through the port of Charleston by vessels from the East Indies early in the present century, and began to spread itself from that centre. During the four years of the war, it made great progress through the country in all directions, especially along the lines of railroads, and by the movement of cavalry through the country woods. It is now all over our streets, and in waste-places, but not as conspicuous as the other weeds, as it is kept well cropped by animals.

I said there was something like rotation observable in the predominance of these "domesticated weeds." Not many years ago, the Florida coffee, *Cassia occidentalis*, was perhaps the most abundant weed about the streets and waste-places. *Maruta Cotula* (wild chamomile) was also very common. Both of these have decreased in quantity, and seem to be on the decline, or at least not able to struggle against those which now have posssession. Is the rotation due to natural causes, viz., the exhaustion of the soil by one plant, and its rest and restoration by others? Or is it the result of greater potency in the conquering plant? Are these champions now in possession to hold their guard until displaced by a superior race, or will they be compelled by natural causes to give way to a new race of settlers?

Aiken, S. C. H. W. RAVENEL.

Notes on the White Mountains Flora.—A note concerning Mr. Prime's collections in this valley reported in the BULLETIN for August, induces me to send you a few lines in regard to my own observations. I have been here since early in July, and have kept a record of all the plants, whether in fruit or flower, that I chanced to see. I have also collected quite largely. When I first came, the charming *Linnaea* was in its beauty, forming odorous mats on the banks of the Copper Mine Brook. Under the pines, too, I had the pleasure of gathering *Moneses uniflora* for the first time. Characteristic regional plants that I have since found have been *Pyrola minor* and *Geum macrophyllum.* Near Bridal Veil Falls I came upon a nice lot of *Habenaria orbiculata.* Near the famous Flume I gathered quite a quantity of *Habenaria dilatata.* The character of the vegetation is extremely boreal, much like that of New Brunswick. *Oxalis acetosella*, *Clintonia borealis*, *Tiarella cordifolia*, *Streptopus* of both species, and *Trilliums* abound. The prevalent *Solidago* now in bloom in the valley is *S. arguta.* *S. thyrsoidea* is to be found up the brook, where I also have my eye on several *Nabali.* I have not yet climbed to alpine heights, but have been surprised to find how high up grow the common yarrow and *Aralia hispida.* I also find *Microstylis monophyllos* at a considerable elevation.

There are no oaks or chestnuts here, nor sassafras. The almost primeval forests are made up of giant pines, rising to over a hundred feet and then feathering out into foliage; birches, beeches, ashes, mountain-ashes, larches and spruces. There are magnificent specimens of all these.

The prevalent weed here is the yarrow (*Achillea millefolium*); the ox-eye daisy is very rare. On the other hand, *Rudbeckia hirta* is common. I have seen but one specimen of *Lappa major.* There are no wild roses or grapes. But two clumps of *Adiantum pedatum* have as yet turned up, and I have seen no rare ferns.

The moss-flora is absolutely bewildering; mosses coat every windfall, every rock, and standing tree. One gathers a mat of what he thinks is one species, and finds he has half a dozen. I should call it the region of mosses.

The other day I saw a *Medeola* in which the three upper leaves were felted together so as to form a nest for a spider. This creature, which I found within, exactly imitated the curious flower of the plant which has to me always had an arachnoid appearance.

Franconia, N. H., Aug. 5th. W. W. BAILEY.

Vincetoxicum scoparium (*Cynanchum scoparium*, Nutt.; *Cynoctonum? scoparium*, Chapm.)—It may be as well to record the fact that this plant, whose habitat has been referred to Florida and the West Indies, I found a few years since on an island in May River, not far from Hilton Head; and lately, still more abundantly on a small uncultivated island between Pinckney's Island and the mainland. It is not alluded to by Elliott, whose home was in Beaufort, about twenty to twenty-five miles off. I find the vines climbing the trees some fifteen to twenty feet high; but, when prostrate, they form dense, mat-like beds or masses of several feet in extent.

Bluffton, S. C., Aug. 8, 1882. J. H. MELLICHAMP.

Notes from North Carolina.—*The North Carolina Crocus.*—In North Carolina there is no other native plant called "crocus," and this appellation to *Epigaea repens* is now never heard.

The use of the word "crocus" for trailing arbutus is no more singular than the local employment of the word "tuckahoe" for *Orontium aquaticum*. How this word was first employed in this way is not known, but it may have had its origin in the Indian word "tawkee," which Prof. Meehan (Flowers and Ferns U. S.) says was the name used by the Indians for *Orontium*. He quotes Kalm's Travels.

Another curious localism is the name "hog-eye" for *Dionaea muscipula*. This is confined to Duplin Co., N. C., and heard nowhere else, I believe. The lobes of the leaf of the *Dionaea*, with their fringed edges, bear a sufficient resemblance to two upper eyelids joined at their base, to have caused Dr. Curtis to notice the fact in a description of the plant.

New Station for Lygodium palmatum.—Heretofore, *Lygodium palmatum* has been found only in the mountain regions of the State. It is now discovered in Duplin County, near the sea-coast.

New Station for Epidendrum conopseum.—This plant was found growing on the limb of a white oak, in Pender County. It does not appear at all in Curtis's Catalogue.

Wilmington, N. C. THOMAS F. WOOD.

(A propos of Dr. Wood's remark on *tuckahoe* in the above notes, it may be stated that this name, meaning "something round," was applied by the Virginia Indians primarily to that curious subterranean, often nearly globular production, still called "tuckahoe," and which was used for making a sort of bread (*taccaho appoans*, "tuckahoe bread."—Strachey.) The name was also applied to several *round* or *roundish* roots (tubers) and was extended to some which (like the starchy rootstock of *Orontium*), though not round, were used like the others as a bread material.

The names given by Kalm for *Orontium* (*tawkee*, *tawkim*, *tackuim*) and for *Peltandra* (*tuckah*, *tawking*) are Swedish corruptions of the Delaware Indian name for these bread materials; a term having about the same meaning as tuckahoe, and being from the same Algonkin root—Abnaki, *petegwi*; Massachusetts, *petukki*; Delaware, *p'tucqui*, "round," or "that which is round."

In some of the northern dialects of the Algonkin, the equivalent of *tuckahoe*—Mass., *petukquineg*, Narrag., *puttuckqunnege*, Mohican, *'tuquauh* or *'tuquogh*, literally "a round thing" or "something round," had the secondary meaning of a "loaf of bread" or a "cake"; but the Virginian term, and its Delaware equivalent, seems to have had the secondary signification of "bread root."—Ed.)

Abnormal Botrychium.—When at West Point in July, I took a walk with Mr. E. S. Denton, which I shall not soon forget. My companion, who is an enthusiast in botany, showed me some of his favorite localities; among them, one for *Camptosorus*. It was a wild place on the side of a mountain, amidst broken boulders and windfalls—a spot to delight a collector. Here I found, what I specially wish to note, a specimen of *Botrychium Virginicum*, Swz., with *three* fertile segments to the frond, all well developed. The stipes were confluent only for about two inches above the point at which the barren frond diverged; above this, entirely distinct and fully fruited. As abnormalities in *Botrychia* are just now made interesting by Mr. Davenport, this note may be worth recording. I retain the specimen described.

W. W. Bailey.

Query for Readers of the Bulletin.—Is there any reason for the statement by country people in various parts of the Union that the beech is never struck by lightning? The question is extra-botanical, perhaps, yet of some possible interest to collectors who may, in thunderstorms, take refuge *sub tegmine fagi*.

W. W. Bailey.

Tricardia Watsoni.—On looking over my note on *Tricardia* in the July Bulletin, I notice that the printer has left out a line of my manuscript, as I am made to say that "Watson found * * * a single specimen at St. George, Utah;" while Mr. Watson was never there at all.* It should have been said that Mr. Watson collected specimens of it near Truckee, Cal., and Dr. Parry collected a single specimen at St. George, Utah. In addition to my former note, I have to add that I have since discovered several fruiting specimens of *Tricardia* at Hawthorne and Candelaria, Nevada. The plant occurs sparingly along the eastern base of the Sierras, from Reno to the southern boundary of Nevada.

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* Upon consulting Mr. Jones's manuscript, we find that, as he states, the printer omitted several words in one of his sentences. We must confess that the proof of neither of Mr. Jones's notes in the July number was read with sufficient care, or compared with his MS.; for, had either been, we should have detected not only the error here alluded to, but also one in his Fern Notes, where, by slip of the pen, he wrote *Botrychium* instead of *Ophioglossum*.—Ed.

Salt Lake City, July 24. MARCUS E. JONES.

Botanical Notes.—*The Colors of Flowers.*—In an interesting article by Grant Allen, in *Nature*, on 'The Colors of Flowers, as illustrated by the British Flora,' the author says:

The different hues assumed by petals are all, as it were, laid up beforehand in the tissues of the plant, ready to be brought out at a moment's notice. And all flowers, as we know, easily sport a little in color. But the question is, do their changes tend to follow any regular and definite order? Is there any reason to believe that the modification runs from any one color towards any other? Apparently, there is. All flowers, it would seem, were in their earliest form yellow; then some of them became white; after that, a few of them grew to be red or purple; and, finally, a comparatively small number acquired various shades of lilac, mauve, violet, or blue.

Some hints of a progressive law in the direction of a color-change from yellow to blue are sometimes afforded us even by the successive stages of a single flower. For example, one of our common little English forget-me-nots, *Myosotis versicolor*, is pale yellow when it first opens; but as it grows older, it becomes faintly pinkish, and ends by being blue like the others of its race. Now, this sort of color-change is by no means uncommon; and in almost all known cases it is always in the same direction, from yellow or white, through pink, orange, or red, to purple or blue. Thus, one of the wall-flowers, *Cheiranthus chamaeleo*, has at first a whitish flower, then a citron-yellow, and finally emerges into red or violet. The petals of *Stylidium fruticosum* are pale yellow to begin with, and afterwards become light rose-colored. An evening primrose, *Oenothera tetraptera*, has white flowers in its first stage, and red ones at a later period of development. *Cobaea scandens* goes from white to violet; *Hibiscus mutabilis* from white through flesh-colored, to red. The common Virginia stock of our gardens (*Malcolmia*) often opens of a pale yellowish green; then becomes faintly pink; afterwards deepens into bright red, and fades away at last into mauve or blue. Fritz Müller noticed in South America a *Lantana*, which is yellow on its first day, orange on the second, and purple on the third. The whole family of *Boraginaceae* begin by being pink, and end by being blue. In all these and many other cases the general direction of the changes is the same. They are usually set down as due to varying degrees of oxidation in the pigmentary matter.

If this be so, there is a good reason why bees should be specially fond of blue, and why blue flowers should be specially adapted for fertilization by their aid. For bees and butterflies are the most highly adapted of all insects to honey-seeking and flower-feeding. They have themselves on their side undergone the largest amount of specialization for that particular function. And if the more specialized and modified flowers, which gradually fitted their forms and the position of their honey-glands to the forms of the bees or butterflies, showed a natural tendency to pass from yellow through pink and red to purple and blue, it would follow that the insects which were being evolved side by side with them, and which were aiding at the same time in their evolution, would grow to recognize these developed colors as the visible symbols of those flowers from which they could obtain the largest amount of honey with the least possible trouble. Thus it would finally result that the ordinary unspecialized flowers, which depended upon small insect riff-raff, would be mostly left yellow or white; those which appealed to rather higher insects would become pink or red; and those which laid themselves out for bees and butterflies would grow for the most part to be purple or blue. Now, this is very much what we actually find to be the case in nature.

The Variability of Oaks.—In some remarks upon a note by Mr. Meehan, on 'Hybrid Oaks,' which appeared on page 55 of the BULLETIN, M. DeCandolle (*Arch. des Sci. Phys. et Nat.*, p. 557) says that it is interesting to find that in a *Quercus robur* raised in America, a country to which the species is not indigenous, and one in which no allied form exists to cross with it, the same mixture of forms has been observed that he called attention to in 1862, when he reduced the so called species *Q. pedunculata* and *Q. sessiliflora* to *Q. robur*. M. DeCandolle remarks that "many similar facts have been noted in annual or perennial plants introduced into cultivation, and no one, it seems to me, can doubt that variations sometimes occur without hybridization."

Botanical Literature.

Sylloge Fungorum omnium hucusque cognitorum. By Prof. P. A. Saccardo. Large 8vo., pp. 768. Padua, Italy.

The first volume of this long-expected work has at length appeared, and will help to fill a want long felt by all students of mycology. It forms a large octavo of 768 pages, with descriptions of about 2,900 species of Sphaeriaceous Fungi. Adding much to the practical value of the work are the *habitat lists*, giving in alphabetical order the names of the trees and plants on which the different species grow. The volume is published at 49 francs, which, considering the labor of preparing such a work, is very reasonable. It is to be hoped that the demand for this first volume may be such as to encourage the author to go on with the compilation of the remaining orders.—J. B. E.

BOOKS AND PAMPHLETS RECEIVED.

Index to the Genus Carex of Gray's Manual. By Jos. F. James. 8vo., pamph., pp. 11. (Reprint from the *Botanical Gazette.*) From the author.

Contributions to the Flora of Iowa. Nos. iv. and v. By J. C. Arthur. 8vo., pamph., pp. 4 and 5. (Extracts from *Proceedings* of the Davenport Acad. Sci.) From the author.

Darwin considéré au point de vue des causes de son succès et l'import-

ance des ses travaux. Par Alph. DeCandolle. 8vo., pamph., (Extract from *Archives des Sciences Physiques et Naturelles.*) From the author.

Our Native Ferns and their Allies. By L. M. Underwood, Ph.D. 12mo., pp. 134. From the author.

Chas. Robert Darwin. By Jos. F. James. 8vo., pamph., pp. 7. (Extract from *Journal* of the Cincinnati Society of Natural History.) From the author.

Notes on the Native Trees of the Lower Wabash and White River Valleys, in Illinois and Indiana. By Robert Ridgway. 8vo., pamph., pp. 40. (From *Proceedings* of the U. S. National Museum.) From the author.

The New Botany, a Lecture on the best method of teaching the Science. By W. J. Beal, M.Sc., Ph.D. (Second edition.) 8vo., pamph., pp. 16. Philadelphia: C. H. Marot. From the publisher.

Sur un caractère de la Batate, dont la singularité dans la famille des Convolvulacées n'a pas été suffisamment remarquée:

Observation de M. Meehan sur la variabilité du Chêne rouvre, et remarque de M. A. De Candolle. Par Alph. De Candolle. 8vo. pamp., pp. 8. (From *Archives des Sciences Physiques et Naturelles*). From the author.

SERIAL PUBLICATIONS.

Proceedings of the Academy of Natural Sciences of Philadelphia. Part i. Jan. to April. (June, 1882.)—'Fruiting of *Ginko biloba*,' by Thomas Meehan; 'New Station for *Corema Conradii*,' by Aubrey H. Smith; 'Relation of Heat to the Sexes of Flowers,' by Thomas Meehan.

Proceedings of the Boston Society of Natural History. Part iii. Oct., 1881—Jan., 1882. (July, 1882.)—'Temperature of Trees,' by D. P. Penhallow.

Transactions of the Massachusetts Horticultural Society for the year 1881. Part ii. (June, 1882.)—'Our Native Plants adapted for Winter Culture for their Flowers,' by Mrs. T. L. Nelson; 'List of Edible Fungi,' by Dr. E. L. Sturtevant; 'Date of Flowering of Trees and Shrubs in Eastern Massachusetts, in 1881, by John Robinson.

Proceedings of the Torrey Club.—The regular meeting of the Club was held at Columbia College on Tuesday evening, June 13th, the President in the chair and twenty-seven members present.

New Stations.—Mr. Britton exhibited specimens of *Helonias bullata*, L., from near Rossville, Staten Island; of *Corema Conradii*, Torr., collected by Mr. C. E. Smith on the Shawangunk Mountains; and of *Triticum violaceum*, Hornm., collected by Prof. T. C. Porter near Andover, Sussex County, N. J., and new to the flora of that State. Judge Addison Brown reported the detection by him of *Xerophyllum setifolium*, Michx., at Ocean Beach, N. J., a somewhat northerly station for it, and stated that *Hudsonia ericoides*, L., was very abundant in the same neighborhood.

Teratological Specimens.—Mr. Britton showed specimens, from Staten Island, of *Alnus serrulata*, Ait., exhibiting phyllody of the bracts, and a specimen of *Anemone thalictroides*, Michx., in which there was an entire suppression of the involucre. Mr. Hogg exhibited specimens of *Convallaria majalis*, L., showing a peculiar change, due, apparently, to a fission of the pedicels. Each division of the latter bore a flower which was somewhat smaller than the normal size, and which in several of the plants was of a decidedly pink color.

The Librarian reported the addition of a large number of books and pamphlets to the library since the date of the last meeting.

The chairman of the Field Committee reported on the field meetings that had occurred up to date, and, in connection therewith, Miss Knight gave an account of the mosses that had been collected during the various excursions.

One corresponding member was elected and nine names were proposed for active membership.

At the regular meeting of the Club held Monday evening, July 8th, the President occupied the chair and fifteen persons were present.

Dr. O. R. Willis remarked upon some recent additions to the flora of Westchester County, and made known an interesting locality that had been little explored by botanists.

Dr. Barstow exhibited, distributed and remarked upon numerous specimens of cultivated plants, which he had brought to the meeting from his grounds in Flushing.

Prof. Day reported *Coronilla varia*, L., escaped from cultivation at Portchester, and *Vincetoxicum nigrum*, L., at New Rochelle.

The chairman of the Field Committee gave an account of the field meetings that had taken place since the last meeting, and stated that Garretson's, S. I., had proved a new locality for *Lysimachia thyrsiflora*, L., and *Festuca nutans*, Willd.

Mr. W. H. Weed showed specimens of *Polyporus hirsutus*, L., which he had obtained in a mine in Pennsylvania at a depth of 290 feet. The specimens were normal, showing none of those distortions usually observed in fungi growing in such localities.

Adhesion in Fruits.—Mr. Britton exhibited an example of syncarpy in the cherry, wherein two drupes were united into one, the adhesion extending to the stones; and also a case of adhesion of two syncarps in the common raspberry.

Nine persons were elected active members.

The Librarian read a lengthy list of books and periodicals that had been received since the last meeting.

Adjourned to September.

Necrology.—Mr. George Fowler Dickie communicates to me the sad intelligence of the death of his father, Dr. G. Dickie, F.L.S., a well known Scottish algologist of Aberdeen, on Saturday, July 15th.

A. B. H.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. IX.] New York, October, 1882. [**No. 10.**

New Western Plants.

By Edward Lee Greene.

Linum (Hesperolinon) Clevelandi.—Slender and diffusely paniculate, ½–1 foot high, glaucous and, to the naked eye, smooth, but under a lens minutely scabrous-puberulent; leaves alternate, linear-lanceolate, 3–6 lines long; stipular glands wanting; pedicels solitary in the axils of the leaves, 6–10 lines long; sepals ovate, acute, smooth and entire, only a line long; petals yellow, 2-toothed at base, not much exceeding the sepals; styles 3; capsule obtuse, little exceeding the calyx. ✓

Collected in the vicinity of Allen's Springs, Lake County, Cal., June, 1882, by Mr. D. Cleveland.

A very well-marked species, to come in between *L. micranthum* and *L. adenophyllum*; differing from the former in its yellow flowers, and from the latter by the absence of glands. ✓

Astragalus Clevelandi.—Sparingly and minutely appressed pubescent, or at length nearly glabrous, stems rather slender, a foot or more high, from a perennial root; leaflets 15–19, oblong-lanceolate, less than a half inch long; peduncles longer than the leaves, and bearing slender racemes 3–6 inches long; flowers hardly more than 2 lines long; the calyx rather villous, its subulate teeth about equalling the tube; corollas white or cream-colored; pod unknown.

Collected in Indian Valley, Lake County, Cal., June, 1882, by Mr. D. Cleveland.

A species whose singularly long racemes of small whitish flowers give it a very striking likeness to *Melilotus alba*.

Saxifraga malvaefolia.—Near *S. Parryi*, but much larger; scape a foot or two high, minutely and rather sparingly glandular-puberulent; leaves rounded-cordate, obscurely lobed and closely toothed, an inch or more in diameter, on petioles somewhat shorter, hairy on the veins beneath, and appearing with the flowers; flowers few and rather large, in a cymose panicle; calyx-teeth triangular, equalling, or even somewhat longer than the short tube, which is truncate at base, and not conspicuously nerved; petals white, obovate-oblong, inserted by short claws nearly in the sinuses of the calyx; filaments subulate, borne a little lower down; carpels united to near the abruptly and widely diverging summits; style stout, shorter than the beak; root woody-fibrous, with no trace of corm.

Known only by a single specimen, said to have been brought from Santa Rosa Island, off the coast of California.

Though closely allied to *S. Parryi*, Torr., it is very distinct, having no corm or bulb, and sending up its leaves and scapes simultaneously. Its calyx is much broader and shorter than in that species, and it is a much larger plant; moreover, its leaves are of thicker texture, scarcely lobed at all, resembling those of *Malva rotundifolia*.

Chamaesaracha physaloides.—Annual (?), glabrous, stems apparently a foot or two high, with spreading, slightly wing-angled branches; leaves ovate, an inch or more long, the lower nearly entire, the upper with coarsely sinuate-toothed margins; flowers on slender pedicels nearly two inches long; calyx small, and, with the upper portion of the pedicel, puberulent with minute, flat, scale-like hairs ; corolla cream-colored, ¾ inch broad ; fruit unknown.

Collected in the Patagonia Mountains of the southern part of Arizona in the month of August, 1881, by Mr. S. P. Buckminster, in a single branch only, which shows a true *Chamaesaracha*, as to calyx and corolla, with the general aspect of an annual *Physalis*.

HOLOZONIA, *Gen. nov.*

Head heterogamous, with 6–8 pistillate, fertile rays, and about 16–20 hermaphrodite but sterile disk-flowers. Involucre of as many herbaceous scales as there are ray flowers, each scale completely and closely enfolding its obovate-oblong, obcompressed, smooth akene. Receptacle small, flat, its chaff united into a tubular, 10–12-toothed cup enclosing the disk-flowers. Corollas white ; those of the ray purple-tinted, deeply cleft into 3 linear divisions, open during the whole day; those of the disk 5-lobed, Pappus of the ray a hyaline, saucer-shaped, entire crown ; of the disk, a pair of extremely slender, deciduous scales, which equal the corollas.

A Californian herb, between *Hemizonia* and *Lagophylla*, but of very distinct generic type, with the aspect of the former, and the obcompressed, completely enfolded ray-akenes of the latter, but differing from it by its perennial root, its united chaff, and especially by the remarkable pappus of both ray- and disk-akenes.

Holozonia filipes (*Hemizonia filipes*, Hook. & Arn., Bot. Beech. Suppl. 356. *Lagophylla filipes*, Gray, Bot. Whipple, 109. Bot. Mex. Bound. 101. Bot. Cal. i, 367.)—The plant has been long known in a very imperfect way. It is not in the least strange that the author of the Botany of Capt. Beechey's Voyage should have placed it in *Hemizonia*, for its whole aspect is so extremely like *Hemizonia luzulaefolia*, with which it grows, that the present writer, at first sight, passed it by for a mere slender form of that species. Dr. Gray, before the fruit was known, transferred it to *Lagophylla* on the strength of the complete enclosure of the ray-akenes by the involucral scales ; but that is its only point of contact with that genus. It has still the chaffy cup of *Euhemizonia*, as also its *numerous white* flowers.

But, while the character of its akenes forbids its admission to *Hemizonia*, its perennial, rhizomatous root, and very singular pappus as certainly exclude it from *Lagophylla*. The first specimens of this rare plant, showing mature akenes, and exhibiting the unexpected character of the root, were collected by the writer, in October, 1881, almost within the limits of the village of Napa. The above generic character is drawn from these specimens, supplemented by others which came, this year, from the vicinity of the Napa Soda Springs.

The character of *Lagophylla* is strengthened by this plant's re-

Plate XXV.

Fig. 4
Fig. 1.
Fig. 3.
Fig. 2.

Phallus Ravenelii, Berk. & Curt.

moval from it. Its three species agree in habit, in their annual root, their few-flowered heads, their yellow rays (always 5) which are not open much after sunrise, and in their akenes, both of ray and disk, being wholly destitute of pappus.

An Imperfectly-described Phalloid.

By Charles H. Peck.

(Plate xxv.)

The description of *Phallus Ravenelii*, B. & C., as published in *Grevillea*, Vol. ii, p. 33, is somewhat imperfect, and efforts to identify the specimens by it are likely to be unsatisfactory and perplexing. I could not myself feel fully satisfied that my specimens belonged to this species until, through the kindness of Mr. H. W. Ravenel, who first collected specimens of it, and for whom it was named, I was permitted to see the manuscript description which he made of it at the time of its discovery. His description is so full and agrees so accurately with my specimens that there is no longer any room for doubt concerning their identity, nor concerning the real characters of the species. The growing interest in these curious plants, and the desirableness of having the specific characters fully published, must be my apology for the notes here given.

Phallus Ravenelii is furnished with an indusium or veil, although the published description makes no mention of it. This omission, however, has been supplied by Prof. W. G. Farlow in his remarks concerning this species in the *Bulletin* of the Bussey Institute, 1878, p. 247; and the presence of the veil is also indicated in the Torrey Bulletin, Vol. vii, p. 11, where Mr. W. R. Gerard has listed this species, with several others, in the section Hymenophallus, whose chief distinguishing characteristic is the veil. In our other indusiate species the veil is so large that it depends below the margin of the pileus in a conspicuous manner; and it is generally net-like in structure because of its numerous perforations. In this species the veil is without perforations and is divided into two parts, one of which is attached to the top of the stem and is concealed beneath the pileus, while the other is attached at the base of the stem and is concealed within the bulb. Sometimes there is also a small intermediate fragment which adheres to and surrounds the middle of the stem, but this is unusual. According to Mr. Ravenel's observations, while the stem and pileus are yet encased within the bulb these two parts of the veil are united, but as the stem elongates they are torn asunder, the one being carried up with the pileus, the other remaining in the bulb.

In *P. indusiatus*, *P. duplicatus* and *P. impudicus* the denuded pileus is coarsely reticulate-pitted, resembling in some degree the pileus of morels (*Morchella*), but in this species its structure is very different. In the description, the pileus is said to be "even," but in reality it is full of minute cells or cavities and has a cellular-spongy structure similar to that of the stem. These cavities or perforations in the upper or exterior surface are smaller than those of the lower or interior surface. They become visible when the spores have disappeared.

In some specimens the perforation or umbilicus at the apex of the pileus is rather large, with a broad margin, giving a truncate appearance such as is ascribed to the species; but in many specimens the apex is more rounded or obtuse, and would not be regarded as truncate. The apical perforation, which in other species communicates with the interior of the stem, in this one is closed, at least in recently developed specimens, although specimens are sometimes found in which the closing membrane has disappeared and the pileus is clearly perforate. This membrane, however, when present, is so depressed or sunk below the surface that it is liable to be overlooked. It makes the pileus umbilicate rather than perforate. Possibly it was this peculiarity of structure that led Rev. C. Kalchbrenner in his paper on New or Little-known Phalloidei, p. 16, to place this species with the *Cynophalli*. Whether this and the other peculiarities of structure already pointed out warrant the separation of this species from the other Hymenophalli or not I leave for other mycologists to decide. The noticeable characters of this species may be grouped together thus:

Bulb ovate, pinkish, sometimes marked by a few irregular, elevated lines or wrinkles, after rupturing slightly split on the margin; pileus conical or ovate-conical, at first covered, except at the apex, by the olive-green spore-stratum, minutely cellular-spongy, umbilicate at the apex, whitish when denuded; stem cellular-spongy, hollow, subcylindrical, tapering upwards within the pileus and surrounded at the top by a short, entire, pendent membraneous veil, also tapering downwards within the bulb and surrounded at the base by a similar cup-shaped veil, whitish; spores narrowly elliptical, .00016′—.0002′ of an inch long, about half as broad.

Plant 4–6 inches high, pileus 1–1.5 inch high, stem 5–7 lines thick. The plant has a wide range. Specimens have occurred in South Carolina, Wisconsin, Ohio, Connecticut, Vermont and New York. It has been found growing in fallow land, among rubbish in open waste-places, among fallen leaves in dry woods and in "cedar swamps." It occurs from September to December. It was discovered by Mr. Ravenel in 1846, but appears to have remained unpublished till 1873.

EXPLANATION OF THE PLATE.—Fig. 1, a fully developed plant of *Phallus Ravenelii*, B. & C. Fig. 2, the upper part of a stem and its denuded pileus. Fig. 3, vertical section of a plant showing the interior surfaces of the bulb, stem and pileus, and the position of the two parts of the veil. Fig. 4, six spores x 400.

A New Crucifer from Mexico.

By M. E. JONES.

DRABA UNILATERALIS, *n. sp.*—Annual, branching at the base and sending out numerous, horizontal, very slender, runner-like branches, 3′–10′ long, which are leafless except at the very base. Leaves obovate or oblanceolate, petioled (except the uppermost), sometimes 1–3-toothed, densely stellate-pubescent. Sometimes the whole plant is densely stellate-pubescent, even to the sepal and pods; but usually the ends of the longest branches, with their flowers and pods, are glabrous. Petals oblanceolate, white, ½ longer than the sepals. Pods about 2″ long and 1½″ wide, twisted, oval or obovate, nearly twice as long as the stout, reflexed or widely spreading pedicels, arranged about 1′ apart all along the stem with pedicels turned so that the pods are all on the lower side of the stem, making the raceme appear scorpioid. The stems show a decided tendency to twine, but they seldom make a complete loop.

This unique crucifer, which scarcely seems like a *Draba*, I discovered about fifteen miles south of the California line in Mexico about sixty miles from San Diego, on April 7th, 1882.

I have many specimens of a form of *Clematis ligusticifolia* with perfect flowers. The plant grows along the coast, north of San Francisco.

The Tuckahoe.—In Virginia and in Maryland this name is applied exclusively to that curious subterranean tuber, *Pachyma cocos.* This tuber is found, I believe, in nearly all the Southern States, and as far north as Kent County, Delaware. In Virginia and in Maryland, when large, they are frequently roasted and eaten with salt by the negroes. This use of them they learned from the Indians, in whose "bill of fare" the tuckahoe, so-called, was quite an important element. It grows several feet below the surface of the ground and is met with only by accident, as in clearing up the land and in making ditches in damp places. When first taken from the earth the tubers are soft enough to be cut with a knife. In shape, they vary, some being oblong like a sweet potato, others globose and, with their coarse brown bark, looking like a cocoanut. They also vary in size ; I have seen them as large as a man's head. The internal substance is white, has a fungoid odor and a taste that I have found mild and pleasant, although it has been described as acrid.

The tuckahoe is most mysterious in its habits. There is at no time any external indication of its existence beneath the surface of the ground. Hogs are very fond of it, and root it up as they do the truffle. The internal substance contains an abundance of branching filaments; but no fertile form of the plant can be found, though some effort has been made to do so the past two seasons.

Tradition says that the Indians had another mode of preparing it, by drying and pounding as they did corn, then converting it into bread.

Baltimore, Md. MARY E. BANNING.

By request, we append the following additional notes on a production that has always been a puzzle to botanists, and the origin of which still remains a conjecture.

Tuckahoe occurs from New Jersey southward to the Gulf of Mexico, and westward to Kansas. It is usually found at planting time, when it is turned up by the plow. It often gives no indication of having been attached to anything, although occasionally (especially in the West) it has been found apparently parasitic on the roots of large trees ; and, again, detached specimens have been found with a piece of root enclosed in the mass. It was first brought to the notice of the public by Dr. Clayton, who, under the supposition that it was a fungus belonging to the same order as puff-balls, sent it to Gronovius under the name of *Lycoperdon solidum*, and, as such, described it in the Flora Virginica. This was about one hundred and forty years ago. Next it was described by Schweinitz, in his Synopsis of the Fungi of North Carolina, under the name of *Sclerotium cocos*, and by Fries, in his Systema Mycologicum, under the name of *Pachyma cocos*. At about the time Schweinitz described it, Dr. Macbride, of South Carolina, communicated to the Linnaean Society of London his own observations on the supposed fungus. The late Dr. Torrey, unaware of the fact that he had been anticipated by Schweinitz, described the production, about the year 1819, in the New York Repository, under the name of *Sclerotium giganteum*, and also published the results of a chemical analysis of it. Dr. Torrey ascertained that, while chemical tests failed to detect the presence of starch (which the microscope had also failed to show), the mass consisted almost entirely of a singular substance which he called sclerotine. Braconnot, some years after this, described the same principle (which in some of its modifications is the jelly of fruits) as pectine. Tuckahoe, possessing no cellular structure, no mycelium and no trace of fructification, was long ago removed from among the fungi, and is now considered by the Rev. M. J. Berkeley and other mycologists as a secondary product, caused by the degeneration of the tissues of some flowering plant, in which a change has occurred similar to that which converts animal tissue into adipocere, and in which the cellulose and all other principles are transformed into a body of the pectose group. This, however, is conjecture merely, against the probable truth of which is the fact that no intermediate states have been found, while none, large or small, presents any trace of plant-structure. Owing to the fact that it is sometimes found attached to the roots of trees, especially those of the fir, Currey and Keller consider it to be an altered state of these occasioned by the presence of a fungus, the mycelium of which traverses, disintegrates, and even obliterates the bark. This view seems to be sustained by the analyses of R. T. Brown (1871) and J. L. Keller (1876). The former found it to be composed of water, 14 per cent.; glucose, 0.93 per cent.; gum, 2.63 per cent.; pectose, 64.45 per cent.; cellulose, 17.34 per cent.; ash, 0.16 per cent., and nitrogen only 0.36 per cent. Keller found 77.27 per cent. of pectose; 3.76 per cent. of cellulose; 3.64 per cent. of ash, and other things in about the same proportion as Brown did. Owing to its chemical composition, the tuckahoe is very nutritious, and was from early times used as a food by the Indians, as implied in its common names "Indian bread" and "Indian loaf." It is also said to be employed, boiled in milk, as a substitute for arrowroot in summer complaints, in the Southern States.

A product which is thought to be the same as tuckahoe grows in China, and is sold as food in the streets of Shanghai under the name of fùh-ling. An account of this is given by the Rev. M. J. Berkeley in the Proceedings of the Linnaean Society of London.)

Arthrocladia villosa, Duby.—Dr. Farlow records that this rare and interesting alga was first found on the New England coast by

Mr. F. S. Collins at Falmouth Heights, Mass. Since then, two other collectors have obtained it in the vicinity of East Falmouth, in the waters of Vineyard Sound, at a place called Menauhant; viz., Rev. G. W. Perry of Auburn, Me., in the summer of 1881, and Mrs. H. L. Chambré of Fall River, Mass., in 1882.

These constitute the third and fourth recorded instances of its occurrence on the American coast. It was first found by Mr Charles Congdon more than thirty years ago, cast ashore at Smithville near Wilmington, N. C. This specimen was figured and described by Harvey in the first volume of the "Nereis."

It had, however, been previously identified by Prof. J. W. Bailey, who received it from Mr. Hooper of Brooklyn, along with fifty or more other plants. I am fortunate enough to have the letter of Prof. Bailey to Mr. Hooper in which he makes report of his study of this lot of specimens. For sufficient reasons, he does not appear to have satisfactorily determined many of them, so he writes:

"You will see by the above how blind a guide I am in the path you have entered. I try to console myself for my incapacity, by saying that most of the specimens sent which I am in doubt about are not in a perfect and fully-developed condition, and that others are decidedly new, or, at any rate, not like anything in my herbarium.

I have worked hard at these specimens, have dissected every one of them, and compared them with everything which they at all resemble, and yet how few I have made out! However, I am paid for my labors by making out that curious plant M. 1. which beyond *any* doubt is the *Arthrocladia villosa* of Duby, a very rare plant and new to the American flora." As little confidence as Prof. Bailey felt in his knowledge of algae, he was about the only American who, at that time, knew anything at all about them.

Taunton, Mass. A. B. HERVEY.

Rosa minutifolia. — Through the kind exertions of Miss F. Fish of Sauzal, mature fruit of this interesting species, described in the August number of the BULLETIN, has been obtained and is being widely distributed, so that we may hope soon to see it in cultivation. The fruit is globose, crowned with the persistent erect calyx-lobes, deeply red-brown, bristly-hispid; seeds generally few, bearing the woolly, at length deciduous style.

In the description of the flower it ought to have been mentioned that the outer calyx-lobes are pinnatifid, which however is alluded to at the end of the article. The locality is Sauzal, not Sanyal as printed.

GEORGE ENGELMANN.

Epipactis Helleborine, the orchis new to America, which was found near Syracuse in 1879, has been discovered growing in considerable quantity (100 to 200 individuals) on a wooded slope of Scajaquady's Creek, in the northerly part of this city. A specimen has been sent to Dr. Gray, who, while pronouncing it to be identical with the Syracuse plant, declares that he can discover no valid distinction between it and *E. latifolia.* It is now to be looked for in other localities.

Buffalo, N. Y. DAVID F. DAY.

Query.—Is it always the case that the common blue flag, *Iris versicolor*, changes the color of its flowers to white when removed from the swamps to garden cultivation? I have never seen any allusion to the fact, if it is so.

A few years ago, whilst in Darien, Ga., a lady showed me a white-flowered flag in her garden, and assured me that she had herself removed it from the neighboring swamp, and that it had become white after removal. Here, in the gardens in Aiken, there is plenty of it—all white-flowered. I have not been able to trace the origin of the plants directly, but they were probably brought from the swamps. Before seeing that in Darien, I had had reason to suspect such a change, and I make this note of inquiry whether it has been observed by others.

Aiken, S. C., Sept. 6th. H. W. RAVENEL.

New Station for Psilotum triquetrum, Swartz.—Last week I found here six or eight specimens of this plant growing under a live oak and pine. It has been identified by Dr. Gray, to whom I sent it, and also by Mr. Ravenel of Aiken, S. C., who informs me that thirty-five years ago he met with the same in St. John's—Berkeley, in this State, but that he has not seen it since. He found about a half dozen specimens growing in an old deserted garden, under "wild orange-trees." Chapman says "*East Florida.*"

Bluffton, S. C., Sept. 18, 1882. J. H. MELLICHAMP.

Echinospermum Greenei, Gray.—As plants gathered by me about the middle of March at San Diego, Cal., and pronounced this species by Dr. Gray, do not agree in some respects with the description in the North American Flora, the following completer one is herewith given:

Annual, 3′–12′ high, appressed-pubescent throughout, branching from the base, branches prostrate or ascending, weak; leaves linear-oblanceolate, the lower ones opposite and usually connate, often linear, bracts broader, sometimes narrowly oblong; racemes bracteate throughout; calyx white- or often yellow-hairy (hairs with a prominent pustulate base), lobes enlarging in fruit, open, lanceolate, acute, with a dense white tuft of hairs at the tip; flowers less than a line long, white; fruit scattered, lowest short-pedicelled, not joined to the stem; nutlets with three distinct (usually white) ridges running more or less regularly from the tip around the sides (but not on the angles) and down the centre to the base on the outer face, and usually with one intermediate one on each side; cross-ridges forming regular meshes with these, and from the angles thus formed arising straight prickles which are scarcely ever glochidiate and often not even barbed; the depressed meshes filled with from one to several tubercles; nutlets cuspidate, ovate, convex on the outer and inner faces; inner face reticulated but not armed, provided with a very prominent ridge running from the sharp tip to the large, almost deltoid scar at the base; angles rounded.

Dr. Gray informs me that the plant is quite rare. This, however, is not the case at and south of San Diego, where it is rather common, but appears to have been overlooked heretofore. The same is true of *Echidocarya Californica* and *Harpagonella Palmeri.*

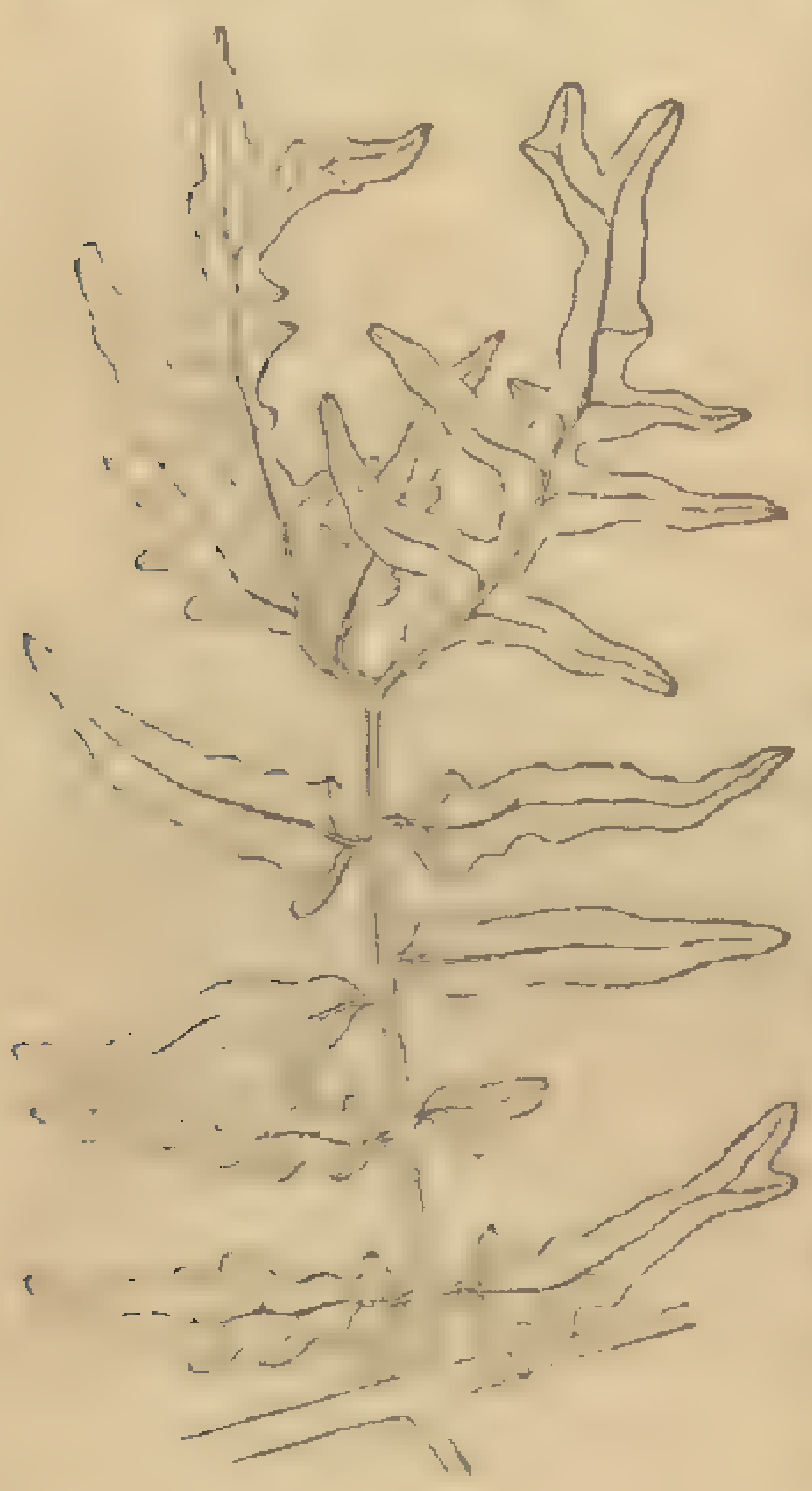
Salt Lake City, Utah. MARCUS E. JONES.

Adventitious leaf on Dandelion.—I have found to-day a dandelion (*Taraxacum Dens-leonis*) with a well-marked though small leaf on the otherwise naked scape. It is three inches below the involucre.

W. W. BAILEY.

Abnormal Growths in Ferns.—The following notes are from observations on specimens collected during the present season on Staten Island:

Pteris aquilina L.—Branches of the frond showing a great tendency to bifurcation. In the specimen figured, one of the branches is three times bifurcated, and many of the pinnae show the same tendency. In another specimen the pinnules are remarkably crenate and finely undulate on the surface, as if passed through a fluting-machine, with many edges fringed.



These two varieties were found in a limited locality, near Tottenville, in company with the var. *caudata*, Hook.,* gradually merging by every intermediate stage into the typical form.

Osmunda cinnamomea, L.— A fertile frond in which the upper half is composed of very much constricted sterile pinnae; apparently approaching var. *frondosa*, Gray, which is, however, distinguished by being fertile above and sterile below, the very opposite of the specimen in question.—Found near Garretson's; one specimen only.

Aspidium acrostichoides, Swartz, var. *incisum*, Gray.—A great many forms seem to be included under this variety. In some of the fertile fronds every one of the pinnae is constricted, and covered with fruit throughout its entire surface. From this extreme there is every intermediate stage to the typical form. In some, the tips only are fertile, in others, the fruit is scattered over the surface promiscuously, and in rare cases is arranged in regular rows as in *A. marginale*, Swartz. Only two localities have thus far yielded these forms; near Four Corners and Egbertville. ARTHUR HOLLICK.

Botanical Notes.—*Expansive Power of Fungi.*—The marvellous expansive power resulting from the rapid growth of the soft cellular tissue of fungi was strikingly illustrated a short time since in a grain elevator at Buffalo, N. Y.

The asphalt flooring of the building was over a foot thick, in two layers. The upper layer was seven inches thick, and was laid hot, rolled down, and thoroughly cooled four years ago. Below this there was an old floor of tar and gravel, six inches thick. A curious bulge in the floor was first noticed, covering about a square foot. In six hours the floor was burst open, and a perfectly formed toadstool, with a stem two inches through and a very wide cap, made its appearance. Elsewhere the floor was smooth and unbroken.

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* It has been decided by Prof. Eaton that the variety found at Staten Island is not the true *caudata.*—ED.

The Sweet Potato.—In a paper which he has kindly sent us, M. DeCandolle calls attention to a character in the sweet potato plant to which sufficient attention has not been paid by systematists, and that is the radical tubercles ("sweet potatoes"), which exist in no other plant of the order Convolvulaceae. "In fact," says the author, "the dilated portions of *Convolvulus Jalapa*, *C. pentaphyllus*, *C. Scammonia*, etc., are caudices or rhizomes, as we may easily satisfy ourselves from figures worthy of confidence published in different works. I shall not stop to question whether in these species the expanded portion is the base of the stem or the principal root or a combination of both, this depending much on the character which we choose for distinguishing root from stem. It is sufficient to point out as a fact that in the sweet potato the expansions belong to lateral roots, while in the other species mentioned, it is the primary axis that becomes a tubercle. This difference is connected with other and greater ones. The roots of the sweet potato (*Convolvulus Batatas*, L.; *Batatas edulis*, Choisy) consist especially of a cellular tissue filled with fecula, and have a saccharine taste. The axillary tubercles, on the contrary, offer a remarkable complication of vessels and cells which secrete resinous matters. The sweet potato is good to eat, but the other roots, like the rhizomes of scammony, are eminently purgative. Generally, in this family, what belongs wholly or in part to the stems is more or less purgative, as the stems of *Convolvulus Sepium* formerly employed. * * * Whether we adopt the genus *Batatas* of Choisy, or whether we reject it, with Meissner, or as Messrs. Bentham and Hooker have done in their Genera, the peculiar and rare character of the roots of the sweet potato should be in some way made prominent, and it appears to be impossible to leave the plant immediately along side of the jalap. * * * The geographical origin of the sweet potato is still a problem. I have tried to solve it in a work now in press, entitled Origin of Cultivated Plants. The probability is in favor of an American origin, but there are very singular reasons for considering the question as doubtful."

The Gymnocladus as a Fly-Poison.—A Virginian correspondent of the *American Agriculturist* asserts that the male trees of the Kentucky coffee-tree (*Gymnocladus Canadensis*) have been long observed by him to be a sure insecticide. He says: "Back of our house here, and overhanging the piazza, is a very large coffee-tree. Though this locality is infested, like Egypt, with a plague of flies, we have never suffered any serious annoyance from them. One year this tree was nearly stripped of its leaves by a cloud of potato-flies (the blistering fly), and we feared that the tree would die from the complete defoliation. In three days, the ground beneath was black with a carpet of corpses, and the tree put out new leaves and still flourishes.

For ten years we have used the bruised leaves, sprinkled with molasses water, as a fly-poison. It attracts swarms of the noisome insects, and is sure death to them."

Although the seeds of *Gymnocladus* are harmless, and have been used as a substitute for coffee, the leaves of the tree are said to contain *cytisine*, a vegetable principle which, in certain doses, acts on the human subject as an acrid poison. It is perhaps to this principle that are to be ascribed the effects of the leaves as an insecticide.

Latent Vitality of Seeds.—Messrs. Ph. Van Tieghem and Gaston Bonnier have been making some preliminary experiments, says *The Gardeners' Chronicle*, to ascertain the effects of different conditions on the latent vitality of seeds. On January 9th, 1880, several packets of seeds supplied by Vilmorin were divided each into three equal parts. One portion was exposed to the free air, but secured from from dust; another portion was put into closed air, securely corked up in a tube; while the third was placed in pure carbonic acid. At the end of two years the seeds were taken out and weighed, and afterwards sown. With regard to weight, all the seeds exposed to free air showed an increase. Thus, for example, fifty seeds of the common pea were found to have increased about $\frac{1}{72}$ of their original weight; and fifty seeds of the French bean about $\frac{1}{56}$ of their original weight. The seeds confined in closed air increased in weight, but infinitely less than those exposed to free air, and the increase in some instances was so trifling as to be hardly measurable. Thus, fifty peas increased about $\frac{1}{790}$ of their original weight, and fifty beans about $\frac{1}{1190}$ of their original weight. As for the seeds placed in carbonic acid, they did not vary half a milligramme from their original weight. The following are two examples of the comparative germination of the seeds, the conditions being as near as possible exactly the same:

Peas left in the free air, 90 per cent. germinated.
" " " closed air, 45 per cent. germinated.
" " " carbonic acid, 0 per cent. germinated.
Beans " " free air, 98 per cent. germinated.
" " " closed air, 2 per cent. germinated.
" " " carbonic acid, 0 per cent. germinated.

The Cross-fertilization of Flowers by Insects.—In his translation of Darwin's work on Cross-fertilization, M. Heckel, in a foot-note, urges, as a decisive argument against the cross-fertilization of flowers by insects, the fact that these latter auxiliary aids are absent from the flowery summits of high mountains, or at least are extremely rare there.

M.Ch.Musset, after four years' residence and observation at Grenoble, in the centre of a region which has all altitudes from 600 to 10,000 feet, comes forward with a note in the *Comptes Rendus* of the Académie des Sciences (T. xcv., No. 6), in which he fully confirms the views of Darwin, and shows that M. Heckel's objection must fall to the ground. He testifies as the result of manifold observations of his own, supported by the testimony of several distinguished botanists and entomologists of the region, that all orders of insects are represented up to an altitude of 9,800 feet; that above that height Lepidoptera, Diptera and certain Hymenoptera are more numerous than the other orders; that the number of genera, species and individuals of nectarophilous insects is proportional to that of flowers, and is sometimes incalculable; that the hours of opening and closing of nyctitropic flowers (which are much more numerous than usually believed) are synchronous with the awakening and sleep of insects; that the apparent number of nectarophilous insects is in physiological and physical relation with the number of their favorite flowers, the calorific and hygrometric, calm or troubled state of the atmosphere, and also with the rainy, stormy, dark or bright state of the sky.

M. Musset adds that dew is one of the predominant causes of the temporary absence of insects.

Botanical Literature.

Contributions to American Botany. X. By Sereno Watson. From the *Proceedings* of the American Academy of Arts and Sciences. Vol. xvii., pp. 316–382.

The contents of this tenth *Contribution* by Mr. Watson, which was presented to the American Academy of Arts and Sciences May 5th, and issued August 10th of the present year, are: I. 'List of Plants from Southwestern Texas and Northern Mexico, collected chiefly by Dr. E. Palmer in 1879–'80. (Part 1. Polypetalae).'—This collection was made in 1879, mostly in the region lying northwest of San Antonio, Texas, and along the routes from that place to Laredo and Eagle Pass on the Rio Grande, and in 1880 in the States of Coahuila and Nuevo Leon in Mexico. In addition, determinations are given of a collection made by Dr. J. G. Schaffner in the State of San Luis Potosi, as well as of some plants received from Prof. Alfred Dugès of Guanajuato, Mexico. Forty-six new species are described. II. 'Descriptions of New Species of Plants chiefly from our Western Territories.'—In this paper, descriptions are given of seventy-seven species, all but three of which have hitherto been unknown to science.

U. S. Commission of Fish and Fisheries. (*Part vii.*) *Report of the Commissioner for* 1879. Washington: Government Printing Office, 1882.

In this Report, just distributed, we find Prof. Farlow's elaborate account of the Marine Algae of New England—a paper which the author issued over a year ago in the form of a reprint, and which we noticed at some length at the time. (BULLETIN, Vol. viii., p. 94.)

SERIAL PUBLICATIONS.

Bulletin of the Buffalo Society of Natural Sciences. Vol. iv., No. 3. (August).—'The Plants of Buffalo and its Vicinity' (Part i.), by David F. Day.

The Syracuse Botanical Club.—We learn from Mrs. Rust that at the March meeting of the Syracuse Botanical Club the following officers were elected for the ensuing year: President, Mrs. M. J. MYERS; Vice-President, Mrs. D. F. GOTT; Recording Secretary, Mrs. HARRIET WHITE; Corresponding Secretary, Mrs. KATE S. BARNES; Treasurer, Mrs. ANNIE D. FAIRBANKS.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. IX.] New York, November, 1882. **[No. 11.**

New Species of North American Fungi.

By J. B. ELLIS.

HENDERSONIA RAUII.—Pustuliform, on capsules of *Polytrichum formosum.* Spores oblong-elliptic, 2-nucleate, subhyaline, 9–11 x 3½ μ, on sporophores longer than the spores.

Found near Bethlehem, Pa., by Mr. E. A. Rau.

HENDERSONIA VIBURNI.—Perithecia bursting through the epidermis in little clusters like a *Valsa.* Spores elliptical, brown, 3-septate, 13–15 x 5½μ, on slender sporophores 2–3 times as long as the spore.

On *Viburnum lentago.* Decorah, Iowa. E. W. Holway.

PESTALOZZIA JEFFERISII.—Pustules black, flat, erumpent, scattered; spores elliptical, 5-septate, brown except the terminal cells, 18–20 x 7½–9μ, on long slender pedicels, with a short (15½–7μ) oblique crest or beak.

On *Viburnum prunifolium.* West Chester, Pa. Haines, Everhart, Jefferis and Gray.

Differs from *P. rostrata* and *P. insidens* (28th Rep. N. Y. State Mus.) in the rather smaller spores and short terminal bristle.

PESTALOZZIA CAPITATA.—Pustules hysteriiform, erumpent, minute, often subseriate by confluence and bearing some resemblance to a *Puccinia;* spores clavate-oblong, 3-septate, the lower division hyaline, the others brown, colored part about 19 x 7½μ, crest 3-parted, the divisions about as long as the spore, spreading and capitate at their tips.

On dead leaves of *Xerophyllum asphodeloides.* Differs from *P. clavata*, C. and E., in habitat and the capitate crest.

CHAETOMELLA STEVENSONII.—Perithecia ovate-globose, $\frac{1}{16}$–$\frac{1}{12}$m m. in diameter, beset with straight, bristle-like black hairs 120–190μ long by about 7 μ thick at the base and gradually tapering to the tip, septate but so opaque that the septa are scarcely discernible; spores fusiform, curved, nucleate, subhyaline, 19–26 x 2½–3μ, on stout branching sporophores of about the same length as the spores.

On fading leaves of *Dentaria laciniata.* Fairmount Park, Philadelphia, Pa. W. C. Stevenson.

Differs from *C. atra*, Fckl., in its slenderer hairs, shorter sporophores, and spores nearly twice as long.

MELANCONIUM HYALINUM.—Bursting through the bark in a semi-transparent mass; spores ovate-pyriform, 11–13 x 7½–8μ.

On dead limbs of Lombardy poplar. Decorah, Iowa. E. W. Holway. No. 102.

Distinguished from *M. pallidum* by its smaller, differently shaped spores and lighter color.

SEPTOSPORIUM FULIGINOSUM.—Appearing like a coarse black pubescence on the bark. Erect hyphae about ¼ m m. high, simple, septate, black; conidia clavate, 75–80 x 15μ, contracted below into a slender stipitate base, pale straw-color.

On dead limbs of *Cornus florida*. West Chester, Pa. Everhart, Haines, Jefferis and Gray.

Coryneum juniperinum.—Forming little black, sphaeriaeform, scattered or aggregated, subconfluent tufts on living leaves of *Juniperus communis*. Conidia vermiform-cylindrical, about 6-septate, dark brown, 35–40 x 6–8μ, on short, stout pedicels.

Decorah, Iowa, May 1882. E. W. Holway.

Helicoma velutinum.—Prostrate hyphae nearly obsolete, erect threads simple, subulate, septate, brown, 114–125 x 3½–4μ; conidia with about two coils, brown and about 12-septate.

H. Curtisii, Berk., differs in its abundant creeping hyphae and its rather broader multiseptate conidia. *H. Mulleri*, Cda., has subhyaline spores not so closely coiled, and slenderer, and has also abundant prostrate hyphae. On decaying bark of *Magnolia*. Newfield, N. J

The measurements not otherwise noted are in micromillimeters. *i. e.*, thousandths of a millimeter.

North American Genera of Grasses.—Notes on Bentham's paper on Gramineae published in Vol. xix. of the Journal of the Linnean Society.

The subjoined list of genera of grasses is intended to comprise all those represented in North America, north of Mexico, arranged according to the system of classification of Bentham in the paper above referred to. Several genera, *Coix*, L., for example, are included that are only known as escapes from cultivation. *Isachne* is inserted without a number as it is doubtful whether it occurs within our limits.

Some of the notes appended to the list have already appeared in another publication, but as they comprise valuable matter for reference they may well appear again for the use of the readers of the Bulletin. The writer has only recently been able to consult the paper by Bentham, or the matter here published would have been presented at an earlier date.

Series A. PANICACEAE.

Tribe I. Paniceae.—1. *Reimaria*, Flügge. 2. *Paspalum*, Lin. 3. *Anthaenantia*, Beauv. (Aulaxanthus, Ell.) 4. *Amphicarpum*, Kunth. 5. *Eriochloa*, HBK. 6. *Beckmannia*, Host. 7. *Panicum*, Lin. 8. *Oplismenus*, Beauv. (Orthopogon, Br.) 9. *Chaetium*, Nees. (Berchtoldia, Presl.) 10. *Setaria*, Beauv. 11. *Cenchrus*, Lin. 12. *Pennisetum*, Pers. (Gymnothrix, Beauv.) 13. *Spartina*, Schreb. (Trachynotia, Mx. Limnetis, Pers.) 14. *Stenotaphrum*, Trin. (Diastemanthe, Steud.) 15. *Pharus*, Lin.

Tribe II. Maydeae.—16. *Coix*, Lin. 17. *Tripsacum*, Lin. 18. *Zea*, Lin. (Mays, Gaertn.)

Tribe III. Oryzeae.—19. *Hydrochloa*, Beauv. 20. *Zizania*, Lin. (Hydropyrum, Link.) 21. *Luziola*, Juss. (Caryochloa, Trin.) 22. *Leersia*, Sw. (Asprella, Schreb.) 23. *Alopecurus*, Lin.

Tribe IV. Tristegineae, Nees.—24. *Thurberia*. Benth. (Sclerachne, Torr. Greenia, Nutt.) 25. *Polypogon*, Desf.

Tribe V. Zoysieae.—26. *Hilaria*, HBK. (Pleuraphis, Torr.) 27. *Aegopogon*, H. B. (Hymenothecum, Lag.) 28. *Tragus*, Hall. (Lappago, Schreb.)

Tribe VI. Andropogoneae.—29. *Imperata*, Cyr. 30. *Erianthus*, Mx. (Ripidium, Trin.) 31. *Elionurus*, H. B. 32. *Rottboellia*, Lin. f. 33. *Manisurus*, Lin. 34. *Ischaemum*, Lin. 35. *Heteropogon*, Pers. 36. *Andropogon*, L. 37. *Chrysopogon*, Trin. 38. *Sorghum*, Pers. (Blumenbachia, Koel.)

Series B. Poaceae.

Tribe VII. Phalarideae.—39. *Phalaris*, Lin. 40. *Anthoxanthum*, Lin. 41. *Hierochloa*, Gmel. (Savastana, Schrank.)

Tribe VIII. Agrosteae.—42. *Aristida*, Lin. 43. *Stipa*, Lin. 44. *Oryzopsis*, Mich. 45. *Milium*, Lin. 46. *Muhlenbergia*, Schreb. 47. *Brachyelytrum*, Beauv. 48. *Lycurus*, HBK. 49. *Heleochloa*, Host. (Pechea, Pourr.) 50. *Phleum*, Lin. 51. *Coleanthus*, Seid. 52. *Phippsia*, Br. 53. *Sporobolus*, Br. (Vilfa, Beauv.) 54. *Epicampes*, Presl. 55. *Agrostis*, Lin. 56. *Arctagrotis*, Griseb. 57. *Cinna*, Lin. (Abola, Adans.) 58. *Gastridium*, Beauv. 59. *Deyeuxia*, Clarion. 60. *Ammophila*, Host. (Psamma, Beauv.)

Tribe IX. Isachneae.—*Isachne*, Br.

Tribe X. Aveneae.—61. *Aira*, Lin. 62. *Deschampsia*, Beauv. 63. *Holcus*, Lin. 64. *Trisetum*, Pers. 65. *Avena*, Lin. 66. *Arrhenatherum*, Beauv. 67. *Danthonia*, DC.

Tribe XI. Chlorideae.—68. *Cynodon*, Pers. 69. *Ctenium*, Panz. (Monocera, Ell.) 70. *Chloris*, Sw. 71. *Trichloris*, Fourn. 72. *Gymnopogon*, Beauv. (Anthopogon, Nutt.) 73. *Schedonnardus*, Steud. 74. *Bouteloua*, Lag. (Eutriana, Trin.) 75. *Eleusine*, Gaertn. 76. *Leptochloa*, Beauv. (Oxydenia, Nutt.) 77. *Buchloë*, Engel.

Tribe XII. Festucaceae.—78. *Pappophorum*, Schreb. 79. *Cottea*, Kunth. 80. *Triodia*, Br. (Uralepis, Nutt. Tricuspis, Beauv.) 81. *Diplachne*, Beauv. 82. *Triplasis*, Beauv. (Diplocea, Raf.) 83. *Eremochloë*, S. Wats. 84. *Phragmites*, Trin. (Arundo, Beauv.) 85. *Monanthochloë*, Engel. 86. *Munroa*, Torr. 87. *Lamarkia*, Moench. (Chrysurus, Pers.) 88. *Cynosurus*, L. 89. *Koeleria*, Pers. 90. *Eatonia*, Raf. 91. *Dissanthelium*, Trin. (Stenochloa, Nutt.) 92. *Catabrosa*, Beauv. 93. *Eragrostis*, Beauv. 94. *Melica*, Lin. 95. *Diarrhena*, Raf. 96. *Streptogyne*, Beauv. 97. *Pleuropogon*, Br. (Lophochlaena, Nees.) 98. *Uniola*, Lin. (Trisiola, Raf.) 99. *Distichlis*, Raf. 100. *Dactylis*, Lin. 101. *Briza*, Lin. 102. *Poa*, Lin. 103. *Graphephorum*, Desv. 104. *Glyceria*, Br. 105. *Festuca*, Lin. 106. *Bromus*, Lin.

Tribe XIII. Hordeae.—107. *Lolium*, Lin. 108. *Agropyrum*, J. Gaertn. 109. *Hordeum*, Lin. 110. *Elymus*, Lin. 111. *Asprella*, Willd. (Hystrix, Moench. Gymnostichum, Schreb.)

Tribe XIV. Bambuseae.—112. *Arundinaria*.

Notes.

1. *Reimaria oligostachya*, Munro, is No. 3566 of Curtiss's Florida plants, ticketed *Paspalum vaginatum*, Sw.
2. *Panicum ignoratum* and *P. rufum* of Kunth are now referred to

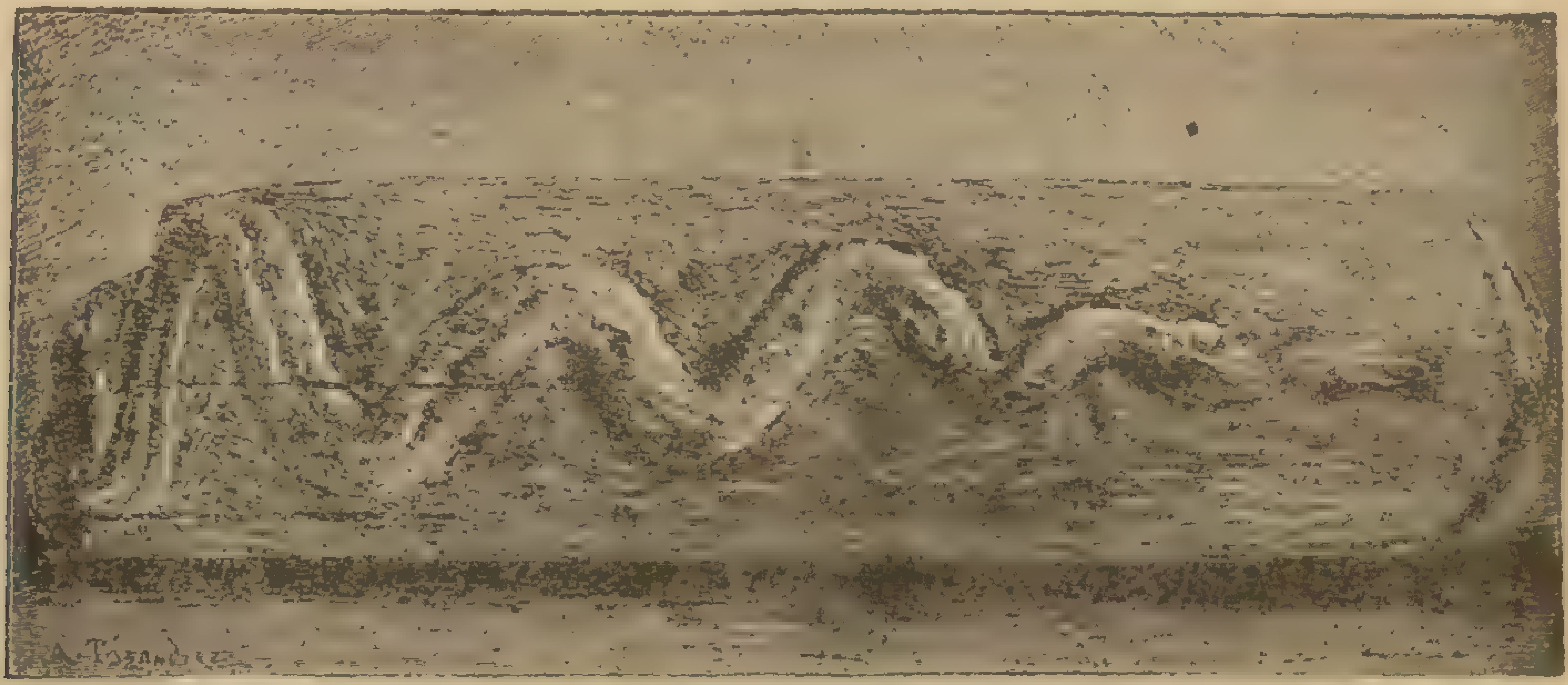
Anthaenantia, Beauv. The former is *A. villosa*, Beauv., and the latter *A. rufa*, Benth.

3. *Eriochloa*, HBK., has the right of priority over *Helopus*, Trin. *E. punctata*, Hamilton, is united with *E. polystachya*, HBK.
4. *Beckmannia*, Host., is placed with the Paniceae after *Eriochloa*.
5. The genus *Panicum* numbers about 250 species. although over 800 supposed species have been described. Steudel enumerates 850.
6. *Berchtoldia*, Presl., is united with *Chaetium*, Nees.
7. *Penicillaria*, Willd., is included under *Pennisetum*, Pers.
8. *Crypsis schoenoides*, Lam., is *Heleochloa schoenoides*, Host.
9. *Thurberia*, Bentham, is substituted for *Greenia* of Nuttall and *Sclerachne* of Torrey, as both these names had already been taken. *Limnas*, Trin., to which Steudel has referred the species of *Thurberia*, is limited to a single and very distinct species from East-Russian Asia.
10. *Hilaria*, HBK., includes *Pleuraphis*, Torr.
11. *Tragus*, Hall., has precedence over *Lappago*, Schreb.
12. *Rottboellia ciliata*, Nutt., is a species of *Elionurus*, Humb. et Bonpl., very closely allied to if not a variety of *E. ciliaris*, HBK.
13. *Andropogon melanocarpus*, Ell.—No. 3641 of Curtiss's Florida plants—is a species of *Heteropogon*.
14. *Sorghum nutans*, *S. avenaceum* and *S. secundum* of Chapman are species of *Chrysopogon*, Trin.
15. *Oryzopsis*, Mx., includes *Eriocoma* of Nuttall, (the *Fendleria* of Steudel.)
16. *Muhlenbergia*, Schreb., includes *Vaseya*, Thurber.
17. *Vilfa* of Beauvois is reduced to *Sporobolus*, Br. The *Vilfa* of Adanson belongs to *Agrostis*.
18. *Cinna macroura* of the Botany of California is *Epicampes rigens*, Benth.
19. *Calamagrotis*, Adans., is separated from *Deyeuxia*, from which the species are distinguished by having no prolongation of the rachilla, or "rudiment of a second flower." Their generally tall and almost reed-like habit, together with the ring of long hairs surrounding the flowering-glume, separates them from *Agrostis*. *Calamagrostis longifolia*, Hook., and *C. brevipilis*, Gray, are referred to the genus *Ammophila*.
20. *Deyeuxia*, Clarion, includes those species in which the rachilla is prolonged into a smooth or more commonly hairy bristle or stipes. *Agrostis aequivalvis*, Trin., is placed in this genus.
21. *Calamagrotis arenaria*, Roth., is referred to *Ammophila*, Host.—*A. arundinacea*.
22. *Aira*, L., includes only two North American species—A. *caryophyllea* and *A. praecox*, Lin. The other North American grasses which have been included in *Aira* are now referred to *Deschampsia*, Beauv. *Aira danthonioides*, Trin., becomes *Deschampsia calycina*, Presl.
23. *Eustachys*, Desv., is united with *Chloris*. Sw.
24. *Chloropsis*, an unpublished genus, is *Trichloris* of Fournier, in his "Enumeration of Mexican Gramineae."
25. *Lepturus paniculatus*, Nutt., is no *Lepturus* at all but a species of *Schedonnardus*, Steud.

26. *Bouteloua curtipendula*, Gray, is *B. racemosa*, Lagasca.
27. *Dactyloctenium Aegyptiacum*, Willd., is now *Eleusine Aegyptiaca*, Pers.
28. *Leptochloa*, P. B., in North America is limited to *L. mucronata*, Kunth.
29. *Triodia*, Br., includes *Uralepis* and *Windsoria* of Nuttall and *Tricuspis* of Beauvois.
30. *Diplachne*, Beauv., is separated from *Leptochloa*, and includes our *L. fascicularis*, Gray, *L. dubia*, Nees., etc.
31. *Uralepis cornuta*, Ell., and *Uralepis purpurea*, Nutt., are now species of *Triplasis*, P. B.
32. *Stenochloa* of Nutall is *Dissanthelium* of Trinius.
33. *Catabrosa*, Beauv., is limited to *C. aquatica*, Beauv.
34. *Lophochlaena*, Nees., is made a synonym of *Pleuropogon*, Br.
35. *Brizopyrum*, Link, is now restricted to a few African species. The American grasses which have been included in this genus are now separated under *Distichlis*, Rafinesque.
36. *Atropis*, Rupr., raised to the rank of a genus in the Botany of California, forms a section under *Glyceria*.
37. *Ceratochloa*, DC., separated from *Bromus* in the Botany of California, is again referred to that genus, forming the fourth section.
38. *Agropyrum*, Gaertn., includes *A. repens*. *A. junceum*, *A. caninum*, etc., the genus *Triticum* being restricted to the cultivated wheats, on the one hand, but made to embrace the species of *Aegilops* on the other.
39. *Elymus Europaeus*, Lin., is *Hordeum sylvaticum*, Huds.
40. *Asprella*, Willd., has precedence, from priority, over *Gymnostichum*.

Girard College, Philadelphia. F. Lamson Scribner.

Some Phenomena connected with the Cambium-Layer.—The accompanying cut, which we borrow from our French cotemporary *La Nature*, illustrates a singular instance of what the young wood-cells constituting the cambium-layer are capable of accomplishing when a foreign organism chances to be introduced into their midst.



The object represented is a small Brazilian reptile—the jaracaca—which was found within the trunk of an ipé-mirim, a tree of common occurrence in the province of Matto Grosso, to the north of the

Amazons, where the specimen was discovered. The piece of wood containing the reptile, after an examination by the scientists of Rio de Janeiro, was taken to France by Mr. Lopes Netto (Brazilian Minister to the United States) and placed in the hands of Mr. Louis Olivier, who, after a careful study of the specimen, submitted the results thereof to the Botanical Society of France.

"What is astonishing," says Mr. Olivier, in an article on the subject in *La Nature*, "is that the entire body of the snake is lignified,* the anatomical study that I have made of it having shown me that it consists of cells and fibres like those of the secondary wood which surrounds it. It is impossible to explain the fact by saying that there has occurred a formation of these elements in a hollow, which, having been traversed by the animal, has preserved the form of the latter; for on the piece of wood it is not only the contour of the snake that is visible, but, indeed, the whole relief of its body.

Just beyond the head there is likewise observed in relief a small cylinder which appears to represent the larva of an insect. It seems, then, that the snake, in pursuing the latter into a fissure in the tree, has insinuated itself between the wood and the bark into the cambium-layer, which is well known to be the generator of wood and secondary liber. The function of this cambium-tissue is twofold; in the interior it gives rise, in a centripetal direction, to ligneous elements, the youngest of which are consequently found at periphery of the wood; but toward the exterior, on the contrary, it produces, in a centrifugal direction, liber fibres, elongated cells, and prosenchymatous elements, the youngest of which are therefore, situated on the internal surface of the bark. If, then, a foreign body be introduced as far as the external limit of the wood, it will, in a few years, become invested with a series of ligneous layers, which are themselves protected by an abundance of bark. Now, in the case under consideration, not only has there been an investment of concentric zones around the reptile, but, besides this, cells and ligneous fibres derived from the cambium-tissues have been substituted for the elements which constituted the external portions of the snake in measure as these have become absorbed. The places that these occupied have, as they gradually disappeared, been taken by secondary wood, whose hypertrophy is proved by the very relief of the snake's body."

The result, as in cases of petrifaction, is that in some parts of the body certain delicate details of the animal's organization are clearly visible. This is especially the case with regard to the nostrils and orbits, and to the arrangement of the scales and cephalic plates over the entire half of the surface of the head.†

In connection with this subject Mr. Olivier makes the following statement to further illustrate some of the phenomena connected with the cambium-layer: "About ten years ago a forest was cut down near Elbeuf, one of the trees of which had been a long time before marked with the letter 'B' to indicate a boundary. This mark had been made, according to custom, with a red-hot iron, which had penetrated the tree to some depth. When the tree was chopped up the mark was still very prominent on the surface of the bark. A blow of the axe given by the woodman parallel with the axis of the trunk, in the external region of the 'sap-wood,' revealed two absolutely plain surfaces, neither of which bore a trace of the letter; but, a second cut, made a little further toward the centre, brought to light a mark 'B' identical with the one presented by the surface of the bark itself." We omit the engraving furnished by Mr. Olivier to illustrate this case, and substitute therefor a cut showing (one-fifth the natural size), an analogous example which was exhibited by Mr. J. D. Hyatt at the September meeting of the Torrey Club. Mr. Hyatt stated that the specimen shown was obtained by Mr. E. C. Morrison in the northern part of Michigan, while making a survey last winter for a railway whose route lay through a section of country entirely covered with forest. During the progress of his work Mr. Morrison frequently found it necessary to verify certain points of the survey by hunting up the trees showing the nearly obliterated scars made by the Government surveyors many years ago in dividing the country up into townships or "sections." Upon removing the wood-growth which covered the "blaze" made by these surveyors, he found the record in most cases perfectly preserved, while the figures and letters, from being filled in by young wood-cells, were exactly copied in relief (as shown in the cut) upon the inner surface of the succeeding annual layer. The specimen figured, which was taken from a hemlock, does not exhibit a complete record, inasmuch as the entire surface of the "blaze" has not been covered by new wood; but Mr. Morrison obtained other examples in which the record was perfect, the date revealed being 1842, and the layers of growth corresponding exactly with the number of years which has since elapsed.

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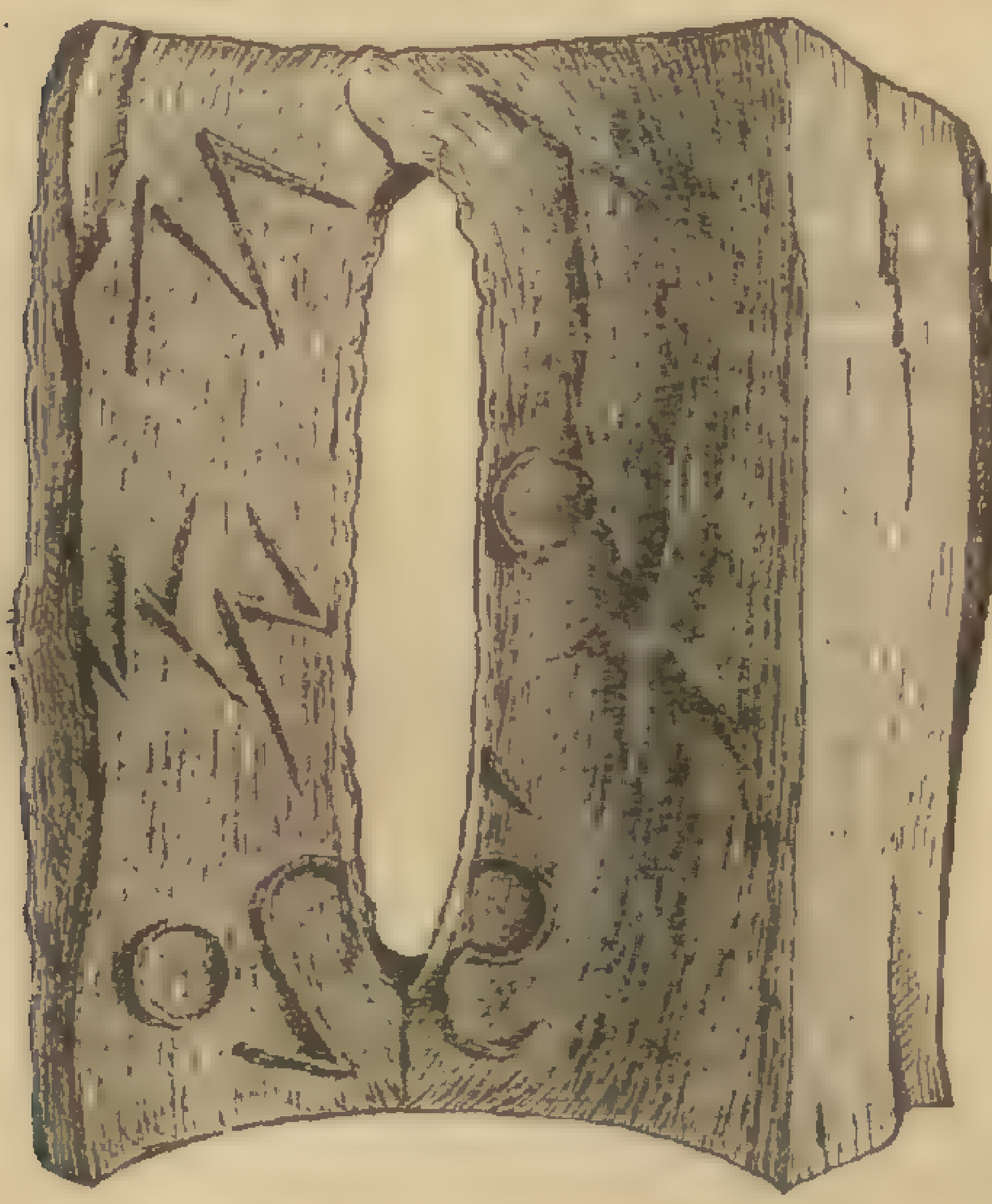
* Except the centre, in which are found the constituent elements of the animal.

† These details are not shown in our cut, which represents the snake about one-third the natural size.



Floral Prolification in Gratiola.—Mr. E. S. Wheeler has sent us from Berlin, Mass., a number of specimens of *Gratiola aurea*, which have regular flowers, with from two to three corollas enclosed one within the other after the manner of those of the "hose in hose" variety of the primrose (*Primula acaulis*). In some cases the innermost corolla is tubular like the outer ones, but in others it is polypetalous. A vertical section of the flowers shows that the multiplication of the parts is due to median prolification. Dr. Masters (Vegetable Teratology) gives Scrophulariaceae as one of the orders in which this sort of change is apt to occur.

Mr. Wheeler remarks that in the locality where these specimens were found no flowers were observed last year, and but few this, the plants having been kept cropped by cattle.

Note on the Tuckahoe.—Reading over the notes on tuckahoe in the October BULLETIN, recalls to mind what little I know of it. I have never met with it about Aiken, but many years ago, when I lived in the coast region of the State, I saw specimens frequently.

Most generally they were picked up in plowed ground, brought to the surface by the plow. I have a distinct recollection of finding on an old half-rotted pine rail, buried under the surface, several specimens, five or six in number, of sizes varying from that of a hen's egg or less, to more than double that size. They seemed attached to the half-rotted rail. They were all perfect in growth, that is, they seemed to have attained their full size, and were covered with the usual coarse, rough, brownish bark. Whether or not they derived any nourishment from this matrix to which they were attached, it is impossible to say.

All that I have ever seen, varying very much in size as they did, seemed to have completed their growth. I have never seen them in any intermediate state, or in such condition as to lead me to suppose they were still increasing in size.

Aiken, S. C. H. W. RAVENEL.

The Canadian Flora.—Botanizing in connection with the meeting of the American Association at Montreal.—Probably the prevailing feeling among botanists at Montreal, from "The States," was one of surprise and disappointment that the Canadian flora was so familiar. At Montreal I noticed nothing of interest either among the weeds or the wild flowers. At Quebec, *Euphrasia officinalis* was abundant on the ramparts. At Tadousac, *Empetrum nigrum* and *Vaccinium Vitis-Idaea* were growing at sea- level,the latter so abundant that children were bringing in pails of the berries for sale.

At Ha! Ha! Bay, where I had intended stopping if the flora seemed attractive, the only unfamiliar plant was *Senecio vulgaris* as an abundant weed.

The meeting next year at Minneapolis will doubtless offer many more botanical attractions to eastern botanists.

Deaf-Mute College, Washington, D. C. J. W. CHICKERING, JR.

Teratological and Other Notes.—(From observations made during 1882).—*Claytonia Virginica;* one specimen with 4 sepals, 9 petals, 9 stamens, 1 style and 4 stigmas. Another with 4 sepals, 10 petals, 8 stamens, 2 styles, and each with 3 stigmas. A third with 3 sepals, 8 petals, 6 stamens, style 1 and the stigmas deformed.

Podophyllum peltatum; four specimens with a single peltate leaf, bearing a flower, the peduncle issuing at about the usual place from a slight depression in the side of the stem. They did not all occur in the same group of plants. Such variable forms are most easily seen just before the leaves expand. Another specimen of the same, otherwise normal, had about 6 sepals, some of them cleft almost to the base; 9 petals, those on one side, as in case of the sepals, larger than on the other; stamens 29; pistils 2, distinct to the base, one about thrice larger than the other, their relative positions corresponding to those of the larger and smaller sepals and petals.

Ranunculus bulbosus; a plant in which all the flowers were at first double, without stamens or pistils; later, the axis was prolonged in each about two inches, and, at its extremity, produced a second similar flower.

Linaria Canadensis; a marked case of fasciation, the stem broadly flattened and about three-sixteenths of an inch wide. Collected at Hammonton, N. J.

Erigeron strigosum having the florets of the heads altered, each producing a secondary head with jointed pedicels that bore a leafy involucre just beneath the joints. The ray-flowers were more conspicuously altered, but this was probably owing only to their earlier development.

Verbena urticaefolia altered similarly to the last. This and the preceding are certainly curious cases of prolification.

Ilysanthes gratioloides fruiting cleistogamously.

Cirsium lanceolatum.—In BULLETIN No. 4 of the current volume, Mr. W. E. Stone queries respecting a white-flowered form of this plant reported by me last year. I would state that it was a fully-developed specimen as regards size, etc. No plant of that species has appeared at the same place this season.

A hybrid Verbascum, found over half a mile from the one reported last year, seems to vary more toward *V. Lychnitis.* I suspect as that one was growing in a group of *V. Blattaria* the latter was the female parent, while this one, found in a group of *V. Lychnitis*, had, on the contrary, the last as female parent. I also observed a *V. Lychnitis* having the branches of the panicle terminating in a rosette of leaves like those of the stem, but smaller.

Concordville, Pa. WILLIAM TRIMBLE.

Botanical Notes.—*Dimorphic Leaves of Aquatic Plants.*—In the *Comptes Rendus* of the Académie des Sciences (T. xcv., p. 487), a note by Mr. E. Mer is published which throws some light on the curious dimorphic leaves of aquatic *Ranunculi.* He considers that as the petioles of submerged leaves elongate, while the contrary is the case with the floating leaves, it is probable that the petiole absorbs the nutritive matter to the detriment of the limb, the submerged leaves not producing starch and not being capable of transpiration. This does not apply to sessile leaves, since in them there is no disturbance of the nutritive balance, the dimensions only of the leaf being lessened.

Chlorophyll.—The investigations of Pringsheim on the nature and mode of formation of chlorophyll have been gone over by A. B. Frank (*fide Jour. Micr. Soc.*,), and among other interesting results arrived at he concludes that the change of color of leaves in autumn is due to the disappearance of the protoplasm of the cells, in consequence of which the chlorophyll grains come in contact with the acid cell-sap, the result being the change of the green color into yellowish green or yellow, followed by the separation of oily drops of hypochlorin. The same change takes place in fruits and also in leaves which become yellow from want of light. Wiesner regards the protection of chlorophyll from injury as one of the functions of vegetable protoplasm.

Electric Phenomena in Plants.—Some interesting results have been obtained by A. J. Kunkel (*fide Jour. Micr. Soc.*), concerning the various electric phenomena observed in plants. He finds that the leaf-veins are generally positive toward the rest of the leaf, but the direction of the current is reversed if the spot on the leaf where the electrode is placed is wetted before the other electrode is placed on the vein. A spot long moistened is positive toward one freshly wetted. When a plant is bent or wounded the electrode near the bend or wound is negative to the other. Dr. J. Burdon Sanderson has noticed somewhat similar phenomena in the leaf of the Venus's fly-trap (*Dionaea muscipula*), the under surface of the sensitive lobe of the leaf being electro-negative to the upper at the moment that the leaf is irritated; after about half a second the upper surface becomes electro-negative and remains so for some time.

Mummy Garlands.—While Egyptologists of every nationality are congratulating themselves and each other upon the safety of the Boolak Museum, it will not be amiss to note that a priceless addition had been made to the treasures of that famous collection shortly before the breaking out of the late rebellion. Several of the royal mummies discovered last year at Dayr-el-Baharee were, it will be remembered, found garlanded with flowers, these flowers being for the most part in as perfect preservation as the specimen plants in a "Hortus Siccus." M. Arthur Rhoné, in a recent letter to *Le Temps*, has described the extremely curious way in which these garlands are woven. They consist of the petals and sepals of various flowers, detached from their stems, and enclosed each in a folded leaf of either the Egyptian willow (*Salix Safsaf*), or *Mimusops Kummel*, Bruce. The floral ornaments thus devised were then arranged in rows (the points being all set one way) and connected by means of a thread of date-leaf fibre woven in a kind of chain stitch. The whole resembles a coarse "edging" of vegetable lace-work. Among the flowers thus preserved are *Delphinium orientalis*, *Nymphaea caerulea* or *N. Lotus*, *Sesbania Aegyptiaca*, and *Carthamus tinctorius*, so largely employed as a dye by the ancient inhabitants of the Nile valley. The dried fruit, as well as the dried yellow blossom of the *Acacia Nilotica* is likewise present; and mention is also made of the blossom of a species of watermelon now extinct. The foregoing are all interwoven in the garlands in which the mummy of Amen-hotep I. was elaborately swathed. With others of the royal mummies were found fine detached specimens of both kinds of lotus, the blue and the white, with stems, blossoms, and seed-pods complete. Still more interesting is it to learn that upon the mummy of the priest Nebsooni, maternal grandfather of King Pinotem II. (XXIst Dynasty), there was found a specimen of the lichen known to botanists as *Parmelia furfuracea*. This plant is indigenous to the islands of the Greek Archipelago, whence it must have been brought to Egypt at, or before, the period of the Her-Hor Dynasty (B.C. 1100 or B.C. 1200). Under the Arabic name of "Kheba," it is sold by the native druggists in Cairo to this day. These frail relics of many a vanished spring have been arranged for the Boolak Museum with exquisite skill by that eminent traveller and botanist Dr. Schweinfurth.

Classified, mounted, and, so to say, illustrated by modern examples of the same flowers and plants, they fill eleven cases—a collection absolutely unique, and likely ever to remain so. The hues of these Old World flowers are said to be as brilliant as those of their modern prototypes; and, but for the labels which show them to be three thousand years apart, no ordinary observer could distinguish between those which were buried with the Pharaohs and those which were gathered and dried only a few months ago.—*Academy*, Sept. 23rd 1882, quoted by Trimen's *Journal of Botany*.

Botanical Literature.

Symbolae Licheno-Mycologicae. Beiträge zur Kenntniss der Grenzen zwischen Flechten und Pilzen, von Dr. Arthur Minks. Zweiter Theil. 8vo. pp. 273. Kassel u. Berlin: Theodor Fischer, 1882.

This second volume of the laborious work of Dr. Minks is now published, and commends itself to botanists interested in the often undisputedly questionable relations of what have heretofore been taken for discomycetous and pyrenomycetous Fungi to Lichens, as a most carefully elaborated, and wholly new contribution to their history. The difficulty of this author's later writings recurs indeed here, that they presuppose an exceptional ability of microscopical manipulation, and an acquaintance with very minute structure which, in the field he occupies, no one perhaps fully shares with him; but it is not easy to believe that a genuine interest in the plants he investigates (to a considerable extent North American) can be satisfied without estimating the value of his results. The old reverence for species as ideal centres, which it was the naturalist's task to seek amid the boundless luxuriance of difference in nature, has been shaken, to say the least, by the preposessions engendered by Darwin's thought; and the hosts ever-growing of "n. spp." with which the very existence, as scientific disciplines, of the classes brought together in thallophytal botany is threatened, find but scant opposition; yet surely no one can question that a competent and sincere attempt to exhaust the structural history of an obscure organism is worth vastly more than any diagnosis of it. That is no sufficient estimate of the systematist's toils which would reduce their result to a mere ticketing of natural objects, the largely accidental and arbitrary character of which work, in whatever hands, can only be relieved in so far as it is possible to confine it to the most experienced inquirers, to be accepted, in good part no doubt blindly, by the rest. But is there not more than this in the study of the system of nature? And can such study be really scientific if it content itself without taking account of the observations and results, and the criticism of genera and species of so honest and thorough-going, whether or not now, like all others mistaken an investigator as Minks?—E. TUCKERMAN.

SERIAL PUBLICATIONS.

Proceedings of the Davenport Academy of Science. Vol. iii., Part ii. (August.)—'Contributions to the Flora of Iowa,' by J. C. Arthur; 'Two new Species of *Oxytheca*' (*O. caryophylloides* and *O. Parishii*), by C. C. Parry.

Grevillea (September).—'Monograph of the British Hypomycetes' (2 plates), by C. B. Plowright; 'On the Heteroecism of the Uredines,' by C. B. Plowright; 'New British Fungi,' by M.C.Cooke; 'Fungi Macowaniana,' by C. Kalchbrenner; 'Australian Fungi,' by M. C. Cooke; 'Three new Indian Fungi,' by M. J. Berkeley.

Proceedings of the Torrey Club.—The regular meeting of the Club was held Tuesday, Sept. 12th, the President in the chair and twenty-five persons present.

Mr. Hollick exhibited and remarked upon some sports in ferns, and a specimen of *Lilium Philadelphicum* in which one of the stamens was replaced by a sepal; and also showed a specimen of *Hepatica* in which the involucre was excessively developed.

Mr. Britton remarked upon some recent additions to the flora of New Jersey, and called attention to some new stations for a few of the rarer forms.

Heterophylly in the Beech.—The President showed specimens of two forms of leaves taken from a beech-tree, one of them being normal and the other deeply incised like those of the variety *incisa* of arboriculturists.

Mr. J. D. Hyatt exhibited a section of the bark and wood of a hemlock, showing on the inner surface of the wood reversed copies in relief of marks made on the tree by surveyors forty years ago. (Described more in detail on another page).

Mr. Schrenk remarked upon the plants found by him during the summer on Mt. Washington.

Dr. Barstow extended an invitation to the Club to visit his residence at Flushing on the 16th to partake of a luncheon.

Two names were proposed for active membership,

At the regular meeting of the Club held Tuesday evening, Oct. 10th, the President occupied the chair and fourteen persons were present.

In the absence of the Librarian, Mr. Gerard read the titles of the books and periodicals which had been sent to the Club since the previous meeting.

The President exhibited a small but tastefully arranged collection of Pacific coast algae, mounted on very large cardboard, a gift from Dr. G. W. Hulse to the Torrey Herbarium. Among the specimens included was one of *Nereocystis lutrarum* 60 feet in length. The President in showing the collection made some interesting remarks on the characteristics and economic uses of the plants represented.

A late-flowering Shrub.—Mr. Bower showed some specimens, from his garden, of *Staphylea trifolia*, L., bearing both fruit and flowers.

Dr. Geo. Vasey, of the Agricultural Department, being present, read upon invitation a paper on 'Three Hybrid Oaks near Washington,' which will be published in a future number of the BULLETIN.

Three persons were elected active members.

BULLETIN
OF THE
TORREY BOTANICAL CLUB.

Vol. IX.] New York, December, 1882. [**No. 12.**

Note on Holozonia filipes.

By Edward Lee Greene.

While my recent account of this interesting plant was in press, I was unexpectedly favored with an opportunity of visiting both of the localities whence my specimens had been derived. The fuller knowledge thus obtained calls for some alteration in the character printed in the October number of this journal. The pappus is found to be extremely variable, and that of the disk-flowers often wanting altogether. But the constant presence of that of the ray-akenes, taken with the great number of flowers in the head (thrice as many as in *Lagophylla*), the perennial root and opposite leaves unite to form a generic type as distinct from *Lagophylla*, on the one hand, as from *Hemizonia* on the other. The following will be found a more satisfactory and complete description than that given on page 122 of this volume:

HOLOZONIA, Greene, *l. c.*

Head heterogamous, with 6–8 pistillate, fertile rays, and 16–20 hermaphrodite but sterile disk-flowers. Involucre of as many herbaceous scales as there are ray-flowers, each scale completely and closely enfolding its obovate-oblong, obcompressed, smooth akene. Receptacle small, flat; its chaff united into a 10–12-toothed cup enclosing the disk-flowers. Corollas white; those of the ray purplish outside, deeply cleft into 3 linear divisions, open all day; those of the disk 5-lobed. Pappus of the ray a hyaline saucer-shaped crown, whose margin is either entire, or sharply toothed, or beset with short bristles; of the disk, two or more long, extremely slender, deciduous bristles, with a more or less chaffy-dilated base, sometimes reduced to one or more minute scales, often wholly wanting.

Holozonia filipes, Greene, *l. c.*—Perennial, spreading by numerous creeping rootstocks; stems 2 ft. high, simple below, above diffusely paniculate; leaves linear, entire, those on the lower half of the stem all opposite, sessile, soft-villous; those of the branches alternate, much reduced in size, glandular; heads on slender pedicels, closely resembling those of *Hemizonia luzulaefolia*. Abundant along mountain streamlets east of Napa Valley, California; its rootstocks imbedded among stones, even in the midst of running streams; flourishing from May to November.

A List of Grasses collected by Mr. C. G. Pringle in Arizona and California, with descriptions of those species not already described in American publications.*

47. *Deyeuxia varia*, Kth. (*Calamagrostis*, DC.)

Mountains about the head-waters of the Sacramento River. Alt., 5,000 ft. August.

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* Continued from page 105.

This grass is referred to *Deyeuxia varia*, Kth., with some hesitation, no authentic specimens being at hand for comparison; but there is little of importance in the description of that species to exclude it. Kunth's characters, where he says: "pilis corollam aequantibus *vel duplo brevioribus ;* arista dorsali *geniculata*, calycem *vix excedente*," describe it exactly.

It differs from *D. sylvatica* in its taller and more slender habit, shorter and less acuminate empty glumes, shorter awns and longer palea, which is similar in texture to its glume. From *Deyeuxia stricta*, as described by American authors, it differs in its twisted and geniculate awn, shorter and more scanty basal hairs and larger and firmer palea.

It is very near No. 3 of Bolander's small collection, and 1,089 of Kellogg & Harford, and appears to be identical with one of the forms (there are two forms among the specimens in hand) included under No. 653 A. of Powell's collection, 1868.

48. *Deschampsia elongata*, Munro, in Benth. Plant. Hartweg, 342; *Aira elongata*, Hook., Fl. Bor. Am., ii., 243. t. 228; Thurber, Bot. Cal., ii., 297.

Strawberry Valley, California. August.

49. *Trisetum canescens*, Buckley, Proc. Acad. Phil., 1862, p. 100; Thurber, Bot. Cal., ii., p. 296.

Mt. Shasta. Alt., 6,000 ft. August.

50. *Trisetum subspicatum*, Beauv. Thurber, Bot. Cal., ii., p. 296

Mt. Shasta. Alt., 7,500 feet. August.

51. *Avena fatua*, Linn. Thurber, Bot. Cal., ii., 295.

Santa Cruz Valley, near Tucson.

This grass is occasionally found on the "ballast" grounds at Philadelphia.

52. *Danthonia Californica*, Bolander, Proc. Cal. Acad., ii., 182; Thurber, Bot. Cal., ii., p. 294.

Mountains about the head-waters of the Sacramento River. Alt., 7,000 feet. August.

53*. *Chloris alba*, Presl. Vasey, Bot. Wheeler Exped., p. 288; Torrey, in Emory's Report, etc.

Santa Cruz Valley, near Tucson, Arizona. June.

54. *Trichloris* (?) *Blanchardiana*, Fournier. *Chloridiopsis Blanchardiana*, J. Gay, in herb.

Culms stout and leafy, about 2 ft. high; sheaths compressed, keeled, hairy on the edges, especially near the throat; upper surface of the conduplicate leaf hairy near the base. Spikes slender, numerous—a dozen or more—3–4 in. long, arranged in a terminal fascicle. Spikelets with one 3-awned perfect flower and a stipitate, 3-awned rudiment. A second rudimentary floret is sometimes present.

Santa Cruz Valley, near Tucson. May.

This grass has been distributed in herbaria as *Chloropsis* or *Chloridiopsis Blanchardiana*, Gay, and is so named in Pringle's sets. The generic name here adopted is based upon the following note in Bentham's 'Notes on Gramineae:' "The genus *Trichloris*, Fournier, comprises two Mexican and two extra-tropical South American species. They resemble *Trisetaria* in the dense oblong crinate panicle and their 3-awned flowering-glumes; but the panicle is composed of simple crowded verticillate spikes, and the spikelets, sessile in two rows on the rachis, with one to three empty awned glumes above the flowering one, are quite those of *Chloris*. The two Southern species have long been indicated and named in herbaria as constituting an independent genus (the one by J. Gay, the other by Munro); but never having been published, we must adopt Fournier's generic name for the whole." We are in doubt as to the specific name applied to this grass by Fournier, and, in the uncertainty, *Blanchardiana* is retained.

55. *Bouteloua hirsuta*, Lagasca Gray, Man., 5th ed., p. 621; *Chondrosium hirtum*, HBK., Nov. Gen. i., 176. t. 59.

Mesas, near Camp Lowell.

56. *Bouteloua polystachya*, Torr., var. *major*, Vasey, in Bot. Wheeler Exped., p. 287.

Mesas; near Camp Lowell. July.

This is a robust form, with leafy, branching culms 2 ft. long, bearing numerous spikes, which are nearly an inch in length. It differs much in habit from No. 403 and No. 1,356 of E. Palmer's collections of 1875 and 1880, which resemble the figure of *B. polystachya*, Torr., in Pac. R. R. Survey, v., pl. 10. The minute characters of the spikelets, however, differ so little that there appears to be no reason for regarding this grass other than a large form or variety of that species.

57.* *Bouteloua Humboldtiana*, Griseb , Pl. Wright., 532; *Eutriana juncifolia*, Kth., Gram., i., 95; *B. juncifolia*, Vasey, in Bot. Wheeler Exped., p. 287; non Lagasca.

Mesas, near Camp Lowell. July.

58.* *Bouteloua aristidoides*, Thurber, Bot. Cal., ii., p. 291; *Dinebra aristidoides*, HBK., Nov. Gen. Pl. i., 171. t. 695.

Mesas, near Camp Lowell. June.

This is the grass doubtfully referred to *B. gracilis*, Hook. f., in Bot. Wheeler Exped., p. 287, and it is distributed in Pringle's sets under this name.

59.* *Leptochloa mucronata*, Kth., var. PULCHELLA, *n. var.*—Culms slender, tufted, erect, 5–10 in. high (including panicle); leaves ½–1 in. long and a line wide; panicle erect, spikes ½–1 in. long.

Santa Cruz Valley, near Tucson. July.

This little grass is so distinct in appearance from the ordinary forms of the species, with their stout culms, elongated and usually wide (½ in.) leaves, and spikes from 2–5 in. long, that it is ventured as a variety. I should be more inclined to think that the special characters of the plant resulted from peculiarities of climate and soil had I not the ordinary form of the species from the same region.

60. *Pappophorum boreale*, Ledeb., Flor. Ross., p. 404; *P. phleoides*, Turcz. It is 947 of Parry and Palmer's coll., 1878; 1,361 of E. Palmer, 1880, and 2,029 of Wright's N. Mex. coll., 1851–2.

Mention is made of this grass by Dr. Torrey in the Pac. R. R. Rept., Vol. iv., where he states that it agrees so well with authentic specimens of *B. phleoides* received from Fischer that he can hardly regard it as even a variety.

The above name is here adopted out of deference to our best American authorities, but the description of *P. nigricans*, Br., in Flora Australiensis, quoted below, defines the essential characters of our plant so well, that, guided by the description alone, I should scarcely hesitate to refer it to that species. I have examined two forms of *P. nigricans* from Australia, one of which has nearly the habit as our plant.[*]

"*Pappophorum nigricans*, Br. Stems a foot to a foot and a half high; leaves flat or convolute, usually narrow, sometimes quite setaceous, glabrous, pubescent or villous; the nodes glabrous or bearded. Panicle dense and spike-like, varying from ovoid to oblong and under one-half an inch long, to narrow cylindrical and 3 in. long, or broader and more branched and 2 to 3 inches long, but always dense, pale or dark colored. Outer glumes varying from one to rather above two lines long, obtuse or acute, striate with usually 7–9 nerves, but sometimes, especially on the lowest glume, reduced to five, and two of these short. Flowering glume not above a line long, more or less hairy outside, especially at the base, with 9 fine, spreading, plumose awns varying from the length of the glume to twice as long. Above the flowering-glume and enclosed in it, is usually a similar smaller one with a male or rudimentary flower, and one or two still smaller empty ones."—Flora Australiensis, Vol. vii., p. 600.

61.* *Pappophorum apertum*, Munro in herb. Benth.(?).—Culm 1–2 ft. high, erect, branched at the base. Panicle, 6–8 inches long, contracted and spike-like, densely flowered, interrupted below and at first more or less enclosed in the upper sheath. Outer glumes about two lines long, the lower a little shorter, oblong or ovate lanceolate, obtuse and two-lobed or notched at the tip. Flowering-glumes 2–4, with 2 to 3 stipitate rudimentary florets above, about a line and a half long and nearly as broad, convex and coriaceous, hirsute below on the dorsal and lateral nerves, otherwise smooth; awns 10–15, those appearing as continuations of the nerves of the glume, stouter and longer (2 lines) than the intermediate ones.

Mesas, near Camp Lowell, Arizona.

This grass is the same as No. 1,360 of E. Palmer's Mexican collection, 1880, which is enumerated in the Kew list of Palmer's plants as "near *P. laguroideum*, Schrad. Grisebach, in Flor. Br. W. Ind., p. 537, has followed Trinius in uniting Schrader's species with *P. alopecuroideum*, Vahl. Pringle's specimens were at first referred to the the last-named species from the correspondence in habit and inflorescence to the descriptions by Steudel and by Grisebach; but I have since been able to compare Pringle's specimens with the West Indian plant, and although there is a resemblance between the two, especially in the inflorescence, the latter is more robust in habit, has narrower and acuminate-pointed outer glumes, and, so far as examined, but one perfect flowering-glume, which is one-half smaller, with longer and more slender awns. So far as the spikelets are concerned there is a close similarity between Pringle's grass and No. 803 of C. Wright, collected in Western Texas in 1849, and ticketed *P. apertum* by Genl. Munro in herb. Bentham, and *P. vaginatum* by Mr. Buckley in herb. Phila. Acad. I fail to detect the slightest difference between the spikelets of No. 803 of C. Wright and No. 1,362 of Palmer's Mexican collection. Between these and Pringle's grass, or the No. 1,360 of Palmer, the difference is more apparent than real, and exists in those characters which are most subject to variation. The culm is rather stouter, the panicle may be a little longer and is more densely flowered and lighter colored, also the spikelets usually have fewer perfect flowers, but in all other essential points they are alike. Should Pringle's grass prove a good variety of No. 803 of C. Wright, which its habit would seem to indicate, Buckley's name might be adopted to designate it, as it is in a measure descriptive.

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[*] PAPPOPHORUM, Schreb.—Panicle contracted and spike-like. Spikelets with 2–4 flowering glumes, the lower perfect, the upper smaller and sterile. Empty glumes two, membranaceous, awnless, exceeding the flowering glumes, the lower one shorter. Flowering glume membranaceous subelliptical 9–13 awned, awns straight, subulate continuous with the glume; palet longer than its glume, bicarinate. Stamens 3, rarely 2. Ovary smooth. Styles 2, terminal. Stigmas plumose with denticulate hairs. Scales 2, truncate, smooth. Grain smooth, enclosed by the palet, free.—Kunth.

Girard College, Philadelphia. F. LAMSON SCRIBNER.

Flora of Richmond Co., N. Y.—ADDITIONS AND NEW LOCALITIES, 1880–1882.

Ranunculus aquatilis, L., var. *trichophyllus*, Chaix. Abundant in Clove Lake Swamp; has appeared spontaneously since last year.

Dentaria laciniata, Muhl. Woods near New Dorp. (Miss C. O. Thompson).

Brassica campestris, L., West New Brighton. Introduced in ballast. Also occasional in old fields.

Brassica rapa, L. Occasionally spontaneous in cultivated fields.

Ascyrum Crux-Andreae, L. Kreischerville.

Vaccaria vulgaris, Host. Tompkinsville. (Miss C. O. Thompson.)

Silene inflata, Smith. New Dorp. Rare.

Stellaria longipes, Goldie. Abundant near Port Richmond.

Stellaria uliginosa, Murr. Rossville. Rare.

Sagina decumbens, T. & G. Roadsides near Woodrow.

Sagina decumbens, T. & G., var. *Smithii*, Gray. Garretson's. Rare.

Gypsophila arvensis, L. New Brighton, in gardens and waste-places. Rare. Introduced.

Malva moschata, L. A single plant near Court House. 1880.

Zanthoxylum Americanum, Mill. Port Richmond.

Rhus typhina, L. Richmond Hill.

Medicago sativa, L. West New Brighton. Introduced in ballast.

Desmodium Canadense, DC. Clove Lake.

Tephrosia Virginiana, Pers. Common around Tottenville.

Prunus Mahaleb, Linn. Escaped to roadsides near Garretson's. Rare.

Prunus Cerasus, L. Thoroughly established in woods and copses, probably through the agency of birds.

Pirus communis, L. Sparingly established in woods and borders of fields.

Amygdalus Persica, L. Along old stone walls and open woods.

Amelanchier Canadensis, T. & G., var. *rotundifolia*, Gray. Prince's Bay.

Sedum ternatum, Michx. Roadsides near Woodrow. Rare.

Aethusa Cynapium, L. Near Clove Lake. Rare.

Carum Carui, L. Roadsides near Four Corners.

Symphoricarpus vulgaris, Michx. Roadsides and waste-places near gardens (escaped).

Lonicera Tartarica, L. Roadside near Huguenot; escaped from gardens.

Viburnum nudum, L., var. *cassinoides*, Gr. Swamps near Watchogue.

Galium trifidum, L., var. *pusillum*, Gr. Near Pleasant Plains. Rare.

Oldenlandia glomerata, Michx. Not rare at Tottenville.

Fedia olitoria, Vahl. Streets of West New Brighton. Rare. (Miss Webster.)

Eupatorium album, L. Common at Tottenville.

Solidago puberula, Nutt. Not rare at Watchogue.

Matricaria Chamomilla, L. West New Brighton. Introduced in ballast.

Artemisia biennis, Willd Rather plentiful near Clove Lake.

Serratula tinctoria, L. West New Brighton. Probably introduced in ballast.

Senecio aureus, L., var. *obovatus*, Gray. Near Richmond.

Helianthus strumosus, L. Near Clove Lake.

Helianthus decapetalus, L. Near Clove Lake.

Lysimachia thyrsiflora, L. Linden Park Swamp.

Mimulus alatus, Ait. Along a brook near Huguenot.

Galeopsis Ladanum, L. "Staten Island." BULL. TORR. BOT. CLUB, vi., p. 115.

Perilla ocimoides, L., var. *crispa*, Gray. "Escaped to roadsides near Huguenot." (W. H. Leggett, in BULL. TORR. BOT. CLUB, ii., 29.)

Echinospermum Lappula, Lehm. West New Brighton. Introduced in ballast.

Cynoglossum officinale, L. One plant near Concord. 1880.

Cuscuta compacta, Juss. Tottenville.

Solanum Carolinense, L. Waste-places and roadsides, New Dorp and New Brighton.

Physalis angulata, L. New Dorp. Abundant in one field.

Nicotiana rustica, L. One plant near Clove Lake. 1880.

Aristolochia Serpentaria, L. Tottenville. (Herb. W. H. Leggett.)

Rumex orbiculatus, Gray. Clove Lake Swamp.

Callitriche Austinii, Engelm. Tottenville and top of Ocean Terrace.

Croton capitatus, Michx. Streets of New Brighton. (Miss C. O. Thompson.)

Cannabis sativa, L. West New Brighton. Common. Introduced in ballast.

Potamogeton pauciflorus, Pursh. "Near Quarantine." (W. H. Leggett).

Sisyrinchium Bermudiana, L., var. *mucronatum*, Gray. Tottenville.

Smilax tamnoides, L. "Staten Island, one plant only." (T. F. Allen. 18th Annual Rept. State Cab. Nat. Hist., p. 202.)

Helonias bullata, L. In a maple swamp near Kreischerville.

Eleocharis melanocarpa, Torr. New Springville and New Dorp.
Scirpus planifolius, Muhl. Tottenville and Garretson's.
Scirpus sylvaticus, L. Near Garretson's.
Scirpus Eriophorum, Michx., var. *laxus*, Gr. Near Richmond.
Carex triceps, Michx. New Dorp.
Carex Muhlenbergii, Schk., var. *enervis*, Boott. (W H. Leggett, in BULL. TORR. BOT. CLUB, vi., 9.)
Carex rosea, Schk., var. *radiata*, Dew. Near Garretson's.
Carex utriculata, Boott. Linden Park Swamp.
Carex canescens, L. Common.
Agrostis spica-venti, L. West New Brighton. Introduced in ballast.
Phalaris arundinacea, L., var. *picta*, Gr. Thoroughly established along a brook near Four Corners.
Poa nemoralis, L West New Brighton. Introduced in ballast.
Poa serotina, Erhr. West New Brighton. Introduced in ballast.
Festuca nutans, Willd. Hills back of Garretson's. Not common.
Festuca ovina, L., var. *duriuscula*, Gray. Near Garretson's.
Bromus multiflorus, Smith. West New Brighton. Introduced in ballast.
Bromus mollis, L. New Dorp. Not common.
Panicum Crus-galli, L., var. *hispidum*, Gr. Common on the salt marshes.
Polypodium vulgare, L. Sparingly near Silver Lake, Four Corners, Richmond, and top of Ocean Terrace.

ARTHUR HOLLICK
N. L. BRITTON.

A New Variety of Carex riparia, Curtis.—Specimens of *Carex riparia*, Curtis, were sent to me in 1881 from Dallas, Texas, by Mr. J. Reverchon, who has just sent me more of the same plant collected in the spring of 1882. It differs enough from the typical form to be considered a variety. Its perigynia are larger and smoother, less flattened—being nearly cylindrical—and with a beak very much larger than that in the typical form. The nerves of the perigynia are *inconspicuous* and *impressed*, especially below the middle, and the plant may very properly be called *Carex riparia*, Curtis, var. IMPRESSA. I have the same plant from Nebraska, with *loosely fruited* spikes. The Texas plant is closely fruited.

Penn Yan, N. Y. S. H. WRIGHT.

Prolification in the Carrot.—One of the most unusual departures from the normal condition which I met with this season was in the flowering of a wild carrot. The flower-stalk had been mown off in the summer and several new ones had been thrown up from near the base, flowering again in October. All were normal but one. In this, the central umbellule, which, as we know, is usually the weakest of the whole, in this instance had developed into a strong stalk 2 in. long, bearing another umbel; and from this the central umbellule had again developed to another umbel, though not in flower at the time of gathering. In other words, there were two series of verticils beneath the terminal umbel. This, I fancy, must be a very rare teratological specimen, and it will be preserved in the herbarium of the Academy of Natural Sciences of Philadelphia.

Germantown, Pa. THOMAS MEEHAN.

Parmelia furfuracea used in Embalming.—In the note on "Mummy Garlands," in the November number of the BULLETIN, mention is made of the identification of *Parmelia (Evernia) furfuracea* among the plants of the royal coffins. But this lichen was found in an Egyptian coffin many years ago, and identified by Prof. Tuckerman. I quote from an article on the Flora of the White Mountains by J. W. Dawson in the *Canadian Naturalist* for April, 1862, page 88:

"Not long ago we unrolled in Montreal an Egyptian mummy preserved in the oldest style of embalming, and found that, to preserve the odor of the spices, quantities of a lichen (*Evernia furfuracea*) had been wrapped around the body, and had no doubt been imported into Egypt from Lebanon or the hills of Macedonia for such uses. Yet the specimens from this old mummy were at once recognized by Professor Tuckerman as identical with this species as it occurs in the White Hills and on Katahdin, in Maine."

New Bedford, Mass. H. W.

The Lignified Snake.—I have seen the original of the famous "snake lignification" from Brazil, and I possess an electrotype from it, given to our Museum by His Excellency the Brazilian Minister. I am convinced there is no snake in the case. I cannot take the time at this moment to give the two credible explanations which suggest themselves. But I shall be much surprised if the Botanical Society of France is found to endorse the account of M. Olivier in *La Nature*.

Cambridge, Mass. A. GRAY.

Ilex with Yellow Berries.—Prof. John Robinson sends me from Essex Co., Mass., a sprig of *Ilex verticillata* with bright *yellow* berries.

Providence, R. I. W. W. BAILEY.

The Tuckahoe.—The articles in the BULLETIN on tuckahoe, the "Indian bread," have induced me to look up a specimen which I obtained at Asbury Park, some seven or eight years ago. It was got when cutting down some trees and removing the roots. The specimen was found, I should think, about eighteen inches from the surface, in yellow ferruginous sand, and encircling the root of an oak, the root being five-eighths of an inch thick. The specimen is six inches long, and two inches at its thickest part. It has a brown epidermis, and looks wonderfully like a baked sweet potato. The interior flesh or pectine presents exactly the appearance of white flour after being mixed with water and thoroughly dried. It is very hard. I published in the local paper at the time a description under the title: "Tuckahoe, or Indian-bread."

A fact not published is this: In 1862, when taking out the stump of a willow-oak (*Quercus phellos*) from my garden at Keyport, N. J., I found among the roots quite a quantity of tuckahoe; several specimens, I should think enough to fill a quart solid. It was soft, and inside had the color and consistency of stiff starch when cold. This, too, was in yellow ferruginous sand.

Freehold, N. J. S. LOCKWOOD.

Preservative for Fungi.—Three years ago I invented what I think a very good and cheap liquid for the preservation of fungi, composed of the following ingredients: 4½ ounces of common salt; 5 ounces of pulverized alum, and 1 quart of white wine vinegar. Mix thoroughly and keep in a wide-mouthed glass jar. Brush off any dirt that clings to the fungus, and drop the freshly gathered plant into the liquid.

I have beside me a large jar of plants that were collected in the summer of 1879. They are now in a perfect state of preservation. They have diminished somewhat in size, but their structure is preserved, and the larvae are effectually destroyed. The liquid often gets filled with sediment and floating particles, to free it from which I pour it off, strain it through a piece of thin muslin and return it to the plants.

Baltimore, Md. MARY E. BANNING.

Note on Grasses.—In a letter just received from Dr. Bentham he states that *Polypogon* is restored to its former place in Agrostideae.

I will add to my notes in the November BULLETIN that *Lepturus paniculatus*, Nutt., is a *Schedonnardus*, Steud., and follows *Gymnopogon*. *Lepturus Bolanderi*, Thurb., is, I think, a true *Lepturus*, R. Br., and follows *Triticum*.

Philadelphia. F. L. SCRIBNER.

Botanical Notes.—*An Electrified Lily.*—During a storm at Montmaurin, in the Upper Garonne, says *La Nature*, M. F. Laroque witnessed a curious electric phenomenon. Looking toward a clump of lilies, he saw the highest immersed in a diffused violet light, which formed an aureole around the corolla. This light lasted for eight or ten seconds. After it had ceased, he approached the lily and found, to his great surprise, that it was wholly deprived of its pollen, while the neighboring flowers were covered with it.

Night-closing in the Leaves of Purslane.—Mr. Meehan notes (*Proceedings* Philada. Acad. Sci.) that, in the list of plants having diurnal or nocturnal motion, *Portulaca oleracea* does not appear. At sundown the leaves, at other times at right angles with the stem, rise and press their upper surfaces against it. The morning expansion begins with dawn, and soon after sunrise the leaves are fully expanded. Mr. Isaac Burk has observed the same thing not only in *Portulaca*, but also in an allied plant of the West Indies, *Talinum patens*.

Rhus cotinoides.—Since its discovery by Nuttall, in the year 1819, in Arkansas, and twenty-three years later by Prof. Buckley, in North Alabama, *Rhus cotinoides*, Nutt., has not been found by any other botanist, and our knowledge of it has remained fragmentary and obscure.

After having been lost to the botanical world for fully forty years, the tree has recently been re-discovered by Mr. Charles Mohr, who made it a special object of his research in his investigations of the forest growth of the Gulf region for the tenth census. Mr. Mohr found the tree growing scattered along one of the rocky ravines that traverse the terrace-like shelves of limestone on the southern declivity of the Cumberland Mountains, as they descend upon the valley of the Tennessee River, in Madison County, Ala. The specimens found here ranged from 25 to 35 ft. in height. The largest one felled measured 35 ft. in length and 12 in. in diameter one foot above the ground.

"Arrived at such dimensions," says Mr. Mohr, in a paper on the subject in the *Proceedings* of the Philadelphia Academy of Natural Sciences," the tree has evidently long passed the best period of its life, judging from the decay by which, more or less, the trunk was found affected. No sign of a decline, however, could be observed in the vigor of its vegetation.

"The trunk divides at a height of from 12 to 14 ft. above its base; the primary limbs are erect, the secondary branches widely spreading, often slightly reclining, smooth, and divide into numerous divaricate reddish branchlets, rugose from the base of the leaf-stalks of the previous season. The bark is rough, covered with a whitish gray epidermis of a deep chestnut-brown underneath, and exfoliating in oblong square scales of uniform size. The inner bark is white, exposed to the air turning rapidly to a deep yellow color, and exudes, when bruised, a resinous sap of a heavy, disagreeable terebinthinous odor. The wood is heavy, very compact, of a fine grain· the white sap wood of small proportion surrounds, as a narrow ring, the deep yellow hard wood, variegated by zones of different shades of brown, imparting to it a beautiful appearance when polished. * * *

"The inner bark and wood are used for dyeing yellow, and it is said, also, for the production of purple tints. On this point, however, no definite information could be obtained.

"Large numbers of trees were cut down during the war to procure a dyestuff much valued at the time, and full-grown ones are now quite scarce near the settlements. On account of the beauty of its wood, the tree is called shittim-wood by the negroes, they believing it to be the same which was used in the construction of the tabernacle in Solomon's Temple. The wood permits of the finest finish; the fineness of its grain, beauty of color and its hardness fit it well for inlaid work, veneering, and the manufacture of smaller articles of all kinds of fancy woodwork.

"As an ornamental tree it far surpasses the European species, and will be found quite as hardy."

As observed in Alabama, the tree appears to be principally confined to the southern declivity of the mountains, from the northern border of the valley of the Tennessee, and strictly to the habitat above mentioned. It was not found on the sandstone cliffs which, but a short distance higher up, overlie the limestone strata, nor lower down the mountain sides, where the soil was deep and rich.

As its wood is used for fuel whenever accessible, the tree would rapidly become extinct within these narrow limits, were it not for its production of rapidly-growing sprouts to form a copious second growth.

Botanical Literature.

A Dictionary of Popular Names of Plants which furnish the natural and acquired Wants of Man in all Matters of Domestic and General Economy, their History, Products and Uses. By John Smith, F.L.S. London : Macmillan & Co.

The scope of this work is sufficiently indicated by the title which we give in full. It is only necessary to add that the plants treated of are arranged alphabetically under their English names, as far as such exist, followed by their systematic names (according to Lindley's system) and a compact statement of their history, characteristics, products and economic uses. Mr. Smith has enjoyed unexceptional facilities for obtaining information on the subjects of which his book treats, inasmuch as he has been officially connected with the Kew Gardens for upwards of forty years, and was assistant to the late Sir W. Hooker in establishing and arranging the Kew Museum of Economic Botany.

The work abounds in information of the most valuable and interesting character, and will prove very handy as a work of reference to every one who takes an interest in the vegetable kingdom.

The Woody Plants of Ohio, arranged under their appropriate Botanical Orders, with Remarks upon their Uses, Qualities and Sources. By John A. Warder, M.D., assisted by David L. James and Joseph F. James. 8vo. pamph. pp. 40.

In this paper, which was presented at the meeting of the Agricultural Convention of Ohio, in Columbus, January, 1882, the author and his assistants have aimed to provide the farmers of Ohio with a reference-list giving the names, relations, habits and uses of the woody plants of the State. The plants are enumerated in the order in which they occur in Gray's Manual; and the names of many are included in the list which, though insignificant from their diminutive size, "are still useful in the arts, or fill an important office in practical forestry as nurse-plants and as undergrowth, or even as 'ground herbage' among the more noble and valuable Trees of the Wood."

Proceedings of the Torrey Club.—The regular meeting of the Club was held at Columbia College, Tuesday evening, November 14th, the President in the chair and twenty-six persons present.

The Librarian reported on the books and pamphlets received since last meeting.

Field Excursions.—Prof. Day, in behalf of the Field Committee, read a report on the field excursions that had taken place during July, August and September.

Adhesion.—Mr. Wilber exhibited a section of a hemlock in which one of the branches had curved inward and become, at its extremity, fused with the trunk. Mr. Britton described and illustrated a case of adhesion between the branches of two maples that had been observed by him recently at Mt. Clair Heights, N. J.

Virescence in the Rose.—A specimen was shown by Mr. Braman of what is popularly called a "green rose"—a condition of the flower in which chlorophyll is substituted in the petals for the usual coloring matter.

Mr. N. L. Britton presented "Notes on the Autumn Flora of Southern Wyoming and Eastern Colorado," illustrated by specimens of the more common and striking plants noticed in that country in September and October. The most prominent feature observed by Mr. Britton in the Flora of Wyoming along the line of the U. P. R. R. was the very general absence of trees, the only species seen being *Pinus flexilis*, James, and *Juniperus occidentalis*, Hook., both occurring sparingly, and a few willows and cottonwoods along Green and Bear Rivers. The common shrubs of Southern Wyoming were *Artemisia tridentata*, Pursh., the most common sage west of Rawlins, known as "mountain sage" and used as a remedy for mountain fever; the "grease-wood," *Obione canescens*, Moq., *Rosa blanda*, Ait., *Spiraea dumosa*, Nutt., *Berberis aquifolium*, Pursh., and *Symphoricarpus occidentalis*, R. Br.

Among the more common herbaceous plants were noticed *Bigelovia* (*Lynosyris*) *graveoleus*, Gray, as very abundant; *Opuntia Missouriensis*, DC.; *Cleome integrifolia*, T. & G.; *Ranunculus Cymbalaria*, Pursh; *Glycyrrhiza lepidota*, Nutt., with its prickly legumes; *Lupinus argenteus*, Pursh, var. *argophyllus*, Watson; and *Chenopodium album*, L.

The tree flora of the foot-hills in Eastern Colorado was found to be much more abundant than that of Southern Wyoming. *Pinus ponderosa*, Dougl., known as yellow pine, was very plentiful, and attained there a height of 80 to 100 ft., and was a very valuable timber tree. *Pinus edulis*, Engelm., the "piñon" of the Mexicans, was a small tree extending as far north as Colorado Springs; *Juniperus Virginiana*, L., was occasional; *Abies Douglasii*, Lindl., was quite plentiful at middle elevations, attaining a height of 75 ft., and known as "swamp pine;" the narrow-leaved cottonwood, *Populus balsamifera*, L., var. *angustifolia*, Watson, and also *Populus angulata*, Smith, were frequent along the streams; *Salix nigra*, Marsh., var. *amygdaloides*, Anders., and *Negundo aceroides* were frequent along the Platte River. The most abundant shrubs were *Quercus alba*, L., var. *Gunnisoni*, Torr., the only oak of the foot-hills, except *Q. Emoryi*, Torr., which was scarce, and was a scrub-oak, seldom rising higher than 10 ft. and occurring plentifully on the dry slopes; *Cercocarpus parvifolius*, Nutt.; *Spiraea dumosa*, Nutt.; *Prunus Americana*, Marsh.; *Vitis riparia*, Michx., and *Acer glabrum*, Torr., the mountain maple.

The more common herbaceous plants were *Artemisia Ludoviciana*, Nutt., vars. *gnaphalodes*, T. & G., and *latiloba*, Nutt., the sage bush of the plains; *Artemisia frigida*, Willd., and *A. dracunculoides*, Pursh., both plentiful; *Liatris punctata*, Hook.; *Argemone Mexicana*, L.; *Clematis ligusticifolia*, Nutt.; several species of *Eriogonurus*; *Euphorbia marginata*, Pursh.; *Achillea Millefolium*, L., a wooly form; *Solanum rostratum*, Dunal; *Lithospermum pilosum*, Nutt., and *Eritrichium glomeratum*, DC., var. *virgatum*, Porter.

The Syracuse Botanical Club—We learn that Mrs. F. J. Myers, owing to her frequent and long absences from home, and to lack of strength to perform the duties connected with the office, felt compelled on the 16th of October to resign the presidency of the Syracuse Botanical Club.